ANNUAL REPORT 2016-2017

River Tern (Sterna aurantia) -Near Threatened & Garganey (Anas querquedula) migratory species Maitollem in Curtorim (Bird Watching Site)

GOA STATE POLLUTION CONTROL BOARD

PANAJI - GOA

LET'S GET THIS SORTED!

BIO-DEGRADABLE WASTE

NON BIO-DEGRADABLE WASTE

RECYCLING STARTS AT HOME !

The importance of recycling not only helps in reducing our garbage but also helps us to understand the amount of garbage we produce.

Segregating the waste at source makes it easier for these items to be recycled effectively and disposed conveniently.

Let us make a conscious effort to segregate our waste and try our best to recycle and reduce our garbage.

Let us help our **Village Panchayats** and **Municipal Councils** to collect and dispose segregated waste in a scientific and environment friendly manner.

THE TIME IS NOW !

REDUCE
REUSE
RECYCLE

GOA

GSPCB

GOA STATE POLLUTION CONTROL BOARD

Dempo Towers, 1st floor, Panaji, Goa 403 001

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GOA STATE POLLUTION CONTROL BOARD
गोंय राज्य प्रदुशण नियंत्रण मंडळ

(An ISO 9001-2008 Certified Board)

Phone Nos : 91-832-2438567, 2438528
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CHAIRMAN'S MESSAGE

As the Board completes another year, it is with great pleasure, that Goa State Pollution Control Board (GSPCB) presents its Annual Report for the financial year 2016-17. The said year has been a year of transition for the GSPCB, during which substantial steps were taken to position the Board for long term effective performance. The Board has taken a proactive approach to create digital platforms. A payment gateway is in place and the Board has adopted the use of the Point of Sale (POS) machine , through HDFC Bank where on-line or cashless fee payment, respectively, are encouraged. It was also marked by the successful completion of the M.Tech. Environmental Engineering Degree by the 25 Board Officials which was initiated in February' 2015, through an MoU between the Board and Birla Institute of Technology (BITS)-Goa. Further, the Board is now certified to the revised ISO standards of Quality Management Systems i.e. ISO 9001:2015, Environment Management Systems ISO14001:2015, and Occupational Health and Safety Assessment Standard OHSAS 18001:2007 on 13/08/16.

In addition to the Board's functions as a Regulatory Authority and State Advisory Body, as GSPCB continues to monitor Air & Water Quality at various locations in the state under the Central Pollution Control Board -National Ambient Air Quality Programme (NAMP) and Monitoring of Indian National Aquatic Resource Series (MINARS) Programme to ascertain that the concerned parameters meet with the prescribed standards We achieved our targets and the team delivered despite a challenging environmental and legal scenario, through its dedicated staff and well equipped MoEFCC accredited laboratory certified by National Accreditation Board for Laboratories (NABL) ISO 17025:2005 : General Requirements For the Competence Of Testing And Calibration Laboratories.

As the Board strives towards achieving its mandate effectively, diligently, and in a timely manner, the Board encourages active public participation in order to further our common commitment to the Environment.

Dharmendra Sharma-(IAS)
Chief Secretary-Govt.of Goa
and Chairman-GSPCB

LOST IN THE WOODS!!

The monsoon was fast approaching
Dark clouds gathered over the skies
The mystic woods beckoned me
To come to their abode and fly

Out I set with my camera
To capture a winged beauty
What I did not foresee
Was the magic of the woods and it's majesty

I followed the birds and the butterflies
Unmindful of the jungle moods
Within no time I found myself
Lost in the woods!!

I was scared and I panicked
Knowing not what to do
Mother Nature told me not be scared and be true
She said she would guide me and
tell me what to do

The dark woods and the beasts
I found to be friends
How unlike humans
Who turn foes and rarely friends!

I had water to drink and fruits to eat
Leafy cushion to sleep and rocks to sit
My friends in the woods allowed me to be the first
To enter the river and quench my thirst

How happy was I to experience this mood
I hope all of you one day get lost in the woods!!

Mr. Parag Ragnekar

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CHAPTER 1

INTRODUCTION

1.1 GENERAL INTRODUCTION

The Goa State Pollution Control Board is an autonomous statutory organization constituted on 1st July, 1988 under the Water (Prevention & Control of Pollution) Act, 1974. Prior to that, when Goa formed part of the erstwhile Union Territory of Goa, Daman and Diu, the Central Board for the Prevention and Control of Water Pollution was performing the functions of the State Board in Goa. The Central Pollution Control Board at Ponda-Goa had established a Section Office for the purpose. The same arrangement continued till the constitution of the State Board. In the meanwhile, the Section Office was re-constituted as West Zonal Office and shifted to Baroda on 4th April, 1988. All the relevant records pertaining to Goa were transferred to the Goa State Pollution Control Board on 12th September, 1988.

The Goa State Pollution Control Board, after its constitution, established its office in the Goa Medical College Complex at Bambolim. In June 1991, the Government of Goa allotted independent premises for the Board at Patto- Panaji, where the Board shifted its' office in September 1991.

On 15th August, 2002 the Board acquired new premises on the 1st floor in Dempo Tower at Patto Plaza, Panaji and shifted its full set-up to this new premise. The office as well as the laboratory were operating from here. Subsequently, on 15th August, 2005, additional premises measuring 311.86 Sq. mt. was acquired on the 4th floor of the same building which was dedicated to the Board Laboratory.

Further the Board has plans to construct a new State of the Art building for establishing a full fledged Laboratory at Saligao by the next year.

1.2 THE BOARD OFFICE

The Goa State Pollution Control Board is presently operating from its own premises on the first floor and the fourth floor of Dempo Towers, EDC Patto Plaza, Panaji-Goa. The Offices of the Chairman, Member Secretary, Technical section, Legal section, Account section, Administrative Section and Scientific section are located on the first floor on a built up area of 600 sq.mts and the laboratory is located on the fourth floor. The Board laboratory and entire Board office is assessed under ISO: 9001:2015, ISO: 14001:2015 and OHSAS: 18001:2007. Additionally, the Board laboratory has obtained accreditations under MoEF (Ministry of Environment & forests) and NABL (national Accreditation Board for Testing & Calibration Laboratories).

Presently, there are one hundred and forty three staff employed in the Board under the various sections. The details of the staff are provided in the table below and the Organization Chart is attached as Annexure I.

Table 1.1: Staff employed in the Board with Name and Designation

SR.NO	NAME OF THE EMPLOYEE	DESIGNATION
	Scientific Section	
1	Mrs. Jenica Sequeira	Scientist 'C'
2	Ms. Connie Fernandes	Scientist 'C'
3	Dr. Mohan Girap	Scientist 'C'
4	Mrs. Francisca Pereira	Scientist 'B'
5	Mr. Sanjay Kankonkar	Scientist 'B'
6	Mr. Nilesh Parsekar	Scientist 'B'
7	Mrs. Anny Dias	Scientific Assistant
8	Mrs. Livia D'silva	Scientific Assistant
9	Mr. Ganpat Naik	Scientific Assistant
10	Mrs. Edma Fernandes	Scientific Assistant
11	Mrs. Joshna Mahale	Scientific Assistant
12	Mrs. Avina Pereira	Scientific Assistant
13	Mr. Chaitanya Salgoankar	Scientific Assistant
14	Mrs. Chetna Naik	Scientific Assistant
15	Mr. Ravi Naik	Scientific Assistant
16	Mrs. Reshma Vaz	Scientific Assistant
17	Mr. Krishnanath Pednekar	Scientific Assistant
18	Mrs. Denza Cardozo	Scientific Assistant
19	Mr. Sajid Inamdar	Senior Laboratory Assistant
20	Mr. Waman Chari	Senior Laboratory Assistant
21	Mr. Santosh Haldankar	Senior Laboratory Assistant
22	Mr. Sanmesh Borkar	Senior Laboratory Assistant
23	Mr. Nilesh Surlekar	Senior Laboratory Assistant
24	Mr. Samir Borkar	Senior Laboratory Assistant
25	Mrs. Jocelyn Coelho	Junior Laboratory Assistant
26	Mr. Kamlesh Kavlekar	Junior Laboratory Assistant
27	Mr. Sunny Pirankar	Junior Laboratory Assistant
28	Mr. Deepak Naik	Junior Laboratory Assistant
29	Ms. Reema Kaulekar	Junior Laboratory Assistant
30	Mr. Freddy Barbosa	Junior Laboratory Assistant
31	Ms. Felsy Pereira	Junior Laboratory Assistant
32	Mrs. Sophia Dias	Junior Laboratory Assistant
33	Mr. Johnny Moniz	Junior Laboratory Assistant
34	Ms. Nishtha Lolayekar	Junior Laboratory Assistant
35	Mrs. Quiteria Fernandes e Pereira	Junior Laboratory Assistant
36	Mrs. Sheetal Laad	Junior Laboratory Assistant
37	Ms. Wilma D'costa	Junior Laboratory Assistant
38	Mr. Anthony Miranda	Junior Laboratory Assistant
39	Mr. Anil Parab	Field Assistant

40	Mr. Chandrashekar Parab	Field Assistant
41	Mr. Xawollino Rodrigues	Field Assistant
42	Mrs. Luiza D'silva	Field Assistant
43	Mrs. Milagrina Colaco	Field Assistant
44	Mr. Sidney Gracias	Field Assistant
45	Mr. Saby Fernandes	Field Assistant
46	Mrs. Sangita Korgaonkar	Laboratory Attendant
47	Mr.Ishu Vishnu Dhulapkar	Laboratory Attendant
48	Mr. Mario Fernandes	Laboratory Attendant
49	Mr. Bhuvan Borkar	Laboratory Attendant
LEGAL SECTION		
1	Mrs. Natalia Dias	Senior Law Officer
2	Mr. Constance Fernandes	Assistant Law Officer
ACCOUNTS SECTION		
1.	Mr. Devendra Arlekar	Assistant Accounts Officer
2.	Mr. Sulesh Naik	Accountant
3.	Mrs. Mitzi D'silva	Accounts Clerk
4.	Mrs. Nevies Miranda	Accounts Clerk
5.	Mrs. Berlyn Fernandes	Accounts Clerk
6.	Mrs. Stefanie Carvalho	Accounts Clerk
ADMINISTRATION SECTION		
1	Mrs. Tulita da Costa e Fernandes	Office Superintendent
2	Mrs. Swapna Naik	Senior Stenographer
3	Mrs. Daya Usgaonkar e Godinho	Upper Division Clerk
4	Mr. Cedric De Souza	Upper Division Clerk
5	Ms. Margaret Cardozo	Junior Stenographer
6	Mrs. Debra Pereira	Junior Stenographer
7	Mrs. Valanie Abranches	Data Entry Operator
8	Mrs. Abygale Vaz	Data Entry Operator
9	Mrs. Dorothy Fernandes	Data Entry Operator
10	Mr. Alleluia D'Mello	Data Entry Operator
11	Mrs. Francisca Auria Lobo	Lower Division Clerk
12	Mrs. Plancy Miranda	Lower Division Clerk
13	Ms. Shane Gracias	Lower Division Clerk
14	Mrs. Ana Maria Lourenco	Lower Division Clerk
15	Mr. Maison Fernandes	Lower Division Clerk
16	Mrs. Supriya Nageshkar	Lower Division Clerk
17	Ms. Joice Coutinho	Lower Division Clerk
18	Mrs. Ria Naik	Lower Division Clerk
19	Mrs. Preeti Barreto	Lower Division Clerk
20	Mrs. Suzee Fernandes	Lower Division Clerk
21	Mrs. Alisha Colaco	Lower Division Clerk

22	Mr. Umesh Kankonkar	Record Keeper
23	Mrs. Gaudalupe Dias	Record Keeper
24	Mr. Lourenco Fernandes	Driver
25	Mr. Gopal Girodkar	Driver
26	Mr. Pravin Kavlekar	Driver
27	Mr. Mahesh Veluskar	Driver
28	Mr. Hemant Satarkar	Driver
29	Mr. Narayan Shirodkar	Driver
30	Mr. Shantadurga Pereira	Driver
31	Mr. Daniel Colaco	Driver
32	Mr. Sebastiao Dias	Driver
33	Mr. Conceicao Colaco	Driver
34	Mr. Derrick Dias	Peon
35	Mr. Salvador Rodrigues	Peon
36	Mrs. Catarina Pereira	Peon
37	Mr. Roque Fernandes	Peon
38	Mr. Ankush Kankonkar	Peon
39	Mrs. Piedade Crasto	Peon
40	Mr. Issac Lobo	Peon
TECHNICAL SECTION		
1	Mr. Sanjeev Joglekar	Environmental Engineer
2	Mrs. Nandan Prabhudessai	Junior Env. Engineer (Civil)
3	Mr. Keshav Fadke	Junior Env. Engineer (Civil)
4	Mr. Abner Rodrigues	Junior Env. Engineer (Civil)
5	Mr. Rohan Nagvekar	Junior Env. Engineer (Civil)
7	Mr. Manoj Kudalkar	Junior Env. Engineer (Mech./ Prod)
8	Mr. Amit Shanbhag	Junior Env. Engineer (Mech./ Prod)
9	Mr. Pravin Faldessai	Junior Env. Engineer (Mech./ Prod)
10	Mrs. Indira Faldessai	Network Engg. (Software)
11	Mr. Sebastiao Barreto	Engg. Assistant (Civil)
12	Mr. Ashley Pereira	Engg. Assistant (Civil)
13	Mr. Vinson Quadros	Engg. Assistant (Civil)
14	Mr. Sebastiao Colaco	Engg. Assistant (Civil)
15	Mr.Liston Fernandes	Engg. Assistant (Mechanical)
16	Mr.Pratik Chari	Engg. Assistant (Computers)
17	Mr. Chetan Upadhye	Network Assistant (Hardware)
18	Mr. Rajendra Naik	Network Assistant (Hardware)

STAFF TAKEN ON CONTRACT BASIS		
1.	Mrs. Pranali Dessai	Junior Law Officer
3.	Mr. Shashank K. Dessai	Junior Env. Engineer (Mech.)
4.	Mr. Vijay Kansekar	Junior Env. Engineer (Mech.)
5.	Mr. Nikhil Caeiro	Junior Env. Engineer (Civil)
6.	Miss. Lee Ann Antao	Junior Env. Engineer (Civil)
7.	Shri. Bento Thomas	Junior Env. Engineer (Civil)
8.	Shri. Digvijay Dessai	Junior Env. Engin eer (Civil)
9.	Shri. Devesh M. Gholkar	Junior Env. Engineer (Civil)
10.	Miss Pratiksha Prabhu	Network Engineer (Software)
11	Mr. VInayak Talankar	Driver
12.	Mr. Sailesh R. Mahale	Driver
13.	Shri. Immam Sheikh	Driver
14.	Shri. Ravi Kadam	Driver
15.	Shri. Hariesh Vernekar	Driver
16.	Shri. Vijay Halarnkar	Driver
17.	Shri.Narayan Haldankar	Driver

1.3 FUNCTIONS OF THE VARIOUS SECTIONS

1.3.1 SCIENTIFIC SECTION

The Board has a full fledged laboratory, operating on the 4th floor of Dempo Towers having a built up area of about 311.86 sq.mts. The laboratory is well equipped with instruments and equipments needed for carrying out analysis of water, air and soil samples of industrial effluents, rivers, wells, etc for chemical, physical and bacteriological parameters including trace and toxic metals, pesticides and organic components. The Board laboratory is MoEF and NABL accredited and follows the procedures and guidelines in accordance with the said accreditations. The laboratory conducts periodical Internal Audits and External Audits of the Board Laboratory processes through NABL approved Auditors. Assessment of the Board laboratory is also conducted every two years under ISO: 17025 and every five years under MoEF requirement.

The Board has set up 18 ambient air quality monitoring stations and 52 water quality monitoring stations under the Central Pollution Control Board sponsored projects National Air Monitoring Programme (NAMP) and National Water Monitoring Programme (NWMP). Of the 18 air stations, 14 are outsourced to MoEF approved laboratories and 4 are operated by the GSPCB. The 52 NWMP stations are all monitored by GSPCB. These stations are monitored at defined intervals and the samples collected are analysed at the Board laboratory for physical, chemical, metals, pesticides and microbiological parameters.

During the year under report the Board laboratory collected 1,360 water samples from various sources such as ETP, STP, mine discharge (settling pond, mining pit, etc.), river water, well water, canal water, etc. and analyzed the same for various parameters. Also, a number of complaints regarding dust and water pollution have been attended to by the laboratory and have conducted ambient air quality monitoring programmes. A number of Stack emission Monitoring programmes have also been conducted during the year.

1.3.2 TECHNICAL SECTION

The Technical Section handles the consent management. The industries, hazardous waste handling facilities, health care facilities, municipal solid waste facilities, etc. are inspected and monitored on regular basis. The inspection reports and analysis reports are put up online through XGN software which are scrutinized by the Technical Committee and subsequently approved by the Chairman upon which consents under the relevant acts and rules are issued. During the year under report, 584 consents have been granted for operation and establishment of the above facilities under the Water and Air Acts, Hazardous Waste Rules, Bio-Medical Rules, Municipal Solid Waste Rules.

Besides, periodic inspections to monitor red category industries are also conducted to check the compliance by the units. Samples of waste water, ambient air and stack emissions are monitored and analyzed in the Board laboratory.

Additionally, inspections in response to public complaints are also conducted as and when required after initially scrutinizing the complaints through the 'Complaint Committee'. The complaints are monitored by inspection, samples are collected and analysed where required and action deemed fit is initiated if required.

1.3.3 LEGAL SECTION

The Legal section handles all the legal / Court matters related to the functions of the Board. The matters are filed before the Hon'ble Supreme Court, the Hon'ble High Court, the National Green Tribunal, the Administrative Tribunal the Appellate Authority under the Air Act and the Water Act and other lower courts.

The Personal hearings for industries, Public Hearing and matters related to Right to Information Act are also looked after by this Section.

Complaints are scrutinized and examined by the legal section before initiating action in the matter. Notices/directions/clarifications are issued to the defaulting units under the Environment (Protection) Act, 1986 i.e Municipal Solid Waste Rules, Hazardous Wastes Rules, Bio-Medical Rules, E- Waste management Rules, Noise Pollution Rules etc. whenever required to seek compliance for the defaultings.

1.3.4 ADMINISTRATIVE CUM ACCOUNTS SECTION

The Administrative Section deals with all the administrative matters of the Board such as service matters of the staff which includes creation of posts, appointments, promotions, leave, tours, stores, calculation of retirement benefits of the employees, etc. Preparation of agenda and minutes for the Board meetings and subsequent follow up for the implementation of the decisions taken herein for smooth functioning of the Board.

The Accounts section of the Board deals with all the accounting and financial matters of the Board such as monitoring of Revenue and Expenditures, preparation of Annual Budget, processing of all files where in financial implications are involved. Advices the Board on financial matters in accordance with the Government Rules and Procedures for smooth functioning. Conduct periodical Audit of the Board Accounts through a Registered Chatered Accountant nominated by the Comptroller and Auditor General of India (CAAG).

1.3.5 OTHER FACILITIES

1.3.5.1 LIBRARY FACILITIES

The Board has a spacious library of its own on the 4th Floor. It has varied publications from different departments/institutions, such as MOEF, CPCB, other State Boards' Annual Reports, etc. Legal, accounts and technical books, ISI Specifications, etc. are also available in the Board library.

1.3.5.2 CONFERENCE ROOM

The Board has a spacious Conference Room on the 1st floor with a seating capacity for 60 people. It is fully air conditioned and has facilities like whiteboard, and over head projector. All Board Meetings and other important meetings are held in the Conference Room.

CHAPTER 2

CONSTITUTION OF THE BOARD

2.1 CONSTITUTION OF THE BOARD INCLUDING CHANGES THEREIN

The present Board was constituted under the chairmanship of Shri. Jose Manuel Noronha. This Board was constituted vide Order No. 5/20/87-STE/P-IV/635 dated 3rd September, 2012 and the composition is as given below:-

Chairman

1. Shri. R.K. Srivastava, Chief Secretary, Government of Goa, Secretariat, Porvorim, Bardez - Goa (w.e.f. 05/03/2016 to 31/12/2016)
2. Shri. Dharmendra Sharma, Chief Secretary, Government of Goa, Secretariat, Porvorim, Bardez - Goa (w.e.f. 01/01/2017)

Members

1. Addl. Principal Chief Conservator of Forests.
2. Director, Directorate of Industries, Trade & Commerce, Panaji
3. Chief Engineer, Water Resource Department, Panaji
4. Director, Directorate of Mines & Geology, Panaji
5. Director, Department of Tourism
6. Shri. Narayan Naik, Sarpanch, Village Panchayat of Sancoale, Sancoale.
7. Shri. Tony Rodrigues, Dy. Mayor, Corporation of City of Panaji.
8. Dr. Vasudev Deshprabhu, Chairperson, Pernem Municipal Council
9. Mrs. Neelam A. Naik – Manager, Shantadurga Higher Secondary School, Sancoale
10. Shri. Shrirang Jamble, Agriculturalist, Savoi – Verem, Ponda
11. Dr. Pramod Sawant, Vice Chairperson, Goa State Infrastructure Development Corporation Ltd, Panaji
12. Ms. Fatima Pereira, Sarpanch, Village Panchayat, Velsao, Goa.

Member Secretary

13. Shri. Levinson Martins, Goa Civil Services.

CHAPTER 3

MEETINGS OF THE BOARD

3.1 During the year under report, the Goa State Pollution Control Board held five Board Meetings under the reconstituted Board. The details of the meetings held during the year are presented in the Table below:-

Sr. No.	Sr. No. of Meeting	Date of meeting	Venue	No. of members who attended the meeting
1.	120th	28/04/2016	Board's Conference Hall	8
2.	121st	29/06/2016	Conference Hall of the Chief Secretary	11
3.	122nd	28/11/2016	Conference Hall of the Chief Secretary	8
4.	123rd	06/03/2017	Conference Hall of the Chief Secretary	8
5.3	123rd (Re-adjourned)	10/03/2017	Conference Hall of the Chief Secretary	7

3.2 EXTRACTS OF MINUTES OF BOARD MEETINGS HELD DURING THE YEAR UNDER REPORT

120th Meeting of The Board
In the 120th Meeting the Board took the following decisions:

Agenda Item no. 01

Confirmation of the minutes of the 119th meeting of the Goa State Pollution Control Board held on 28th January, 2016.

The members perused and confirmed the minutes of the 119th meeting of the Goa State Pollution Control Board held on 28th January, 2016, so as to enter the same in the minutes book.

Agenda Item no. 02

Follow up action on the decision taken at the 119th meeting of the Board held on 28th January, 2016

Agenda item no. 03- The members noted that the Consent to Operate under the Water Act and Air Act has been issued to the mining leases i.e. M/s. Geetabala M.N. Parulekar-Gulliem e Gaval (Pissurlem) Iron Ore Mine, M/s. V.G.Quenin-Sonshi Iron Ore Mine and M/s. N.S. Narvekar Minerals (Kalay Iron Ore Mine).

The members also noted that the Consent to Operate under the Water Act and Air Act has not been issued to M/s. Dattaraj Velingkar, Corpadega Valuco Predio PurnaPericodil E Terrenos Adjacentes (Corpadega Iron Ore Mine).

Agenda Item No.04- The members noted that the Consent to Establish (expansion) under the Air Act and the Water Act has been issued to M/s Cipla Limited, located at Plot no. M-61, M-62, M-63, N-5, Verna Industrial Estate, Verna, Salcete Goa.

Agenda item no. 05 - The members noted that the Consent to Establish(expansion) under the Air Act and the Water Act has been issued to M/s Cipla Limited, located at Plot no. S-103 to S-105, S-107 to S-112, L-138, L-147, L-147/1 to L-147/4 & L-150, Verna Industrial Estate, Verna, Salcete Goa

Agenda item no. 06 - The members noted that the Consent to Establish(expansion) under the Air Act and the Water Act has been issued to M/s Cipla Limited, located at Plot no. S-103 to S-105, S-107 to S-112, L-138, L-147, L-147/1 to L-147/4 & L-150, Verna Industrial Estate, Verna, Salcete Goa

Agenda item no. 07 - The members noted that the Consent to Establish(expansion) under the Air Act and the Water Act has been issued to M/s.Glenmark Pharmaceuticals Limited, located at Plot No.S-7, Colvale Industrial Estate, Colvale Bardez Goa.

Agenda item no. 08 - The members noted that the Consent to Establish(expansion) under the Air Act and the Water Act has been issued to M/s. Oriental Containers Limited, located at Plot No.327 to 332, Kundaim Industrial Estate, Kundaim Ponda Goa.

Agenda item no.09**-** The members noted that the Consent to Operate (expansion) under the Air Act and the Water Act has been issued to M/s.Himachal Futuristic Communications Limited, located at Plot No.35, 36,37, Verna Industrial Estate, Verna Salcete Goa

Agenda item no. 10- The members noted that the Consent to Establish under the Air Act and the Water Act has been issued to M/s.Goan Marine Impex Pvt. Ltd., located at Plot No.23/1, Barcem Quepem Goa

Agenda item no. 11- The members noted that the Consent to Operate under the Air Act and the Water Act has been issued to M/s. S.N.S. Marine Services Pvt. Ltd., located at River Mandovi, Panaji Goa

Agenda item no. 12- The members noted that the Consent to Operate (expansion) under the Air Act and the Water Act has been issued to M/s. Floating Pontoon, Agnelo Fernandes, located at River Mandovi, Britona Bardez Goa. The Member Secretary informed the members that the Board is in receipt of a complaint regarding the issue of consent to the floating pontoon at the concerned location and the same is under examination.

Agenda item no. 13**-** The members noted that the Consent to Establish (expansion) under the Air Act and the Water Act has been issued to M/s.Zuari Agro Chemicals Limited, located at Plot No.157 & 163, Zuarinagar.

Agenda item no. 14- The members noted that the Consent to Establish (expansion) under the Air Act and the Water Act has been issued to M/s.Wyeth Limited, located at Plot No.L-137,Verna Industrial Estate, Verna Salcete Goa

Agenda item no. 15- The members noted that the Consent to Establish (expansion) under the Air Act and the Water Act has not been granted to M/s.Hindustan Coca Cola Beverages Pvt. Ltd , located at Plot No.M-2 to M-11,Verna Industrial Estate, Verna Salcete Goa, since the approval from the State's HPCC on Industries and from Goa Investment Promotion and Facilitation Board has not been submitted.

Agenda item no. 16- The members noted that the Consent to Operate (expansion) under the Air Act and the Water Act has been issued to M/s. Cadila Health Care Limited., located at Kundaim Industrial Estate, Kundaim Goa.

Agenda item no.17- The members noted that the proposal of re-designation of Assistant Accounts Officer has been submitted to Department of Environment and awaiting approval.

Agenda item no.18- The Member Secretary informed the members that the office vehicle

No.GA-01-S-6345, Toyota Qualis has been sold for ₹1,40,000.00 (Rupees One Lakh Forty Thousand Only) to Monica Flesiana Fernandes, resident of Dugrem, Agassaim Goa through public auction held on 23/03/2016 in the conference hall of the Board.

In its place, Board has purchased new vehicle i.e. Mahindra TUV 300 T4 for an amount of Rs.8,27,048.00 (Rupees Eight Lakhs Twenty Seven Thousand Forty Eight Only) on 30/3/2016.

Agenda item no.19- The Member Secretary informed the members that the Ambient Air Quality monitoring has commenced. The Board members were further briefed about the monitoring/ study so far and the need to extend the Ambient Air Quality monitoring Station upto 31st May 2016. Further action will be initiated based on the report on the comprehensive study being carried out. The members approved the same.

Agenda item no.20- The Member Secretary informed the members that the Sustainable Workflow Platform (SAP Software) has been commissioned and has been operational in the Board.

Table item no.01

The members noted that the salary of the personal staff of the then Chairman has already been paid and Chairman has submitted a technical resignation to the Board and from the date of the resignation of the Ex-Chairman the personal staff of the then Chairman has been relieved from service.

Table item no.02

The Member Secretary informed the members that the training for the Group 'D' Staff as per requirement will be commenced shortly.

Table item no.03- The members noted that the proposals to formulate schemes or to tie up with one or any such banks for the purpose of granting loans to Board employees for the purchase of motor car/ computer etc. has been sought and reply has been awaited.

Table item no.04- The matter with respect to the Board officials/ staffs to travel abroad on personal trips, came up for discussions. The Member Secretary informed the members that the Chairman of the Board is final authority to approve the same.

After discussions the Chairman of the Board approved the same.

Table item no.05- The members noted that the Consent to Establish (Expansion) under the Water Act and Air Act has been granted to M/s. A W Faber-Castell (I) Pvt.Ltd/L, located at Survey No.24/1, D, Corlim.

Table item no.06- The members noted that the Authorization for setting up Treatment Facility for Municipal Solid Waste and landfill site has been granted to Margao Municipal Council.

Agenda Item No.03

Grant of Consent to operate to mining units

Application for Consent to Operate of mining units were placed before the Board and it was informed that following documents/ information were obtained from mining units and the same were placed before the Technical Advisory Committee which recommended for granting Consent to Operate.

After detailed discussion it was approved to grant Consent to Operate under the Water Act and Air Act to following three mining leases that applied for Consent to Operate.

Sr. no.	T.C no.	Name of the mine	E.C limit	Extraction of ore permitted by Dte. of Mines and Geology
1.	4/49	M/s. Rajaram Bandekar (Sirigao) Mines Pvt.Ltd.,	0.437 MT/annum	0.197 MT/annum
2.	8/61	M/s. Madachem Bat Mines Pvt. Ltd, T.C. No. 8/61	0.025 MT/annum	0.012 MT/annum
3.	1/Fe/Mn/78	M/s. Gajanan S.Padiyar,	350T/annum	No capping as it is a manganese mine.

Chairman further stated that a direction has to be issued to the Department of Transport for providing tarpaulin cover and for ensuring compliance as per order issued by Hon'ble High Court for transportation of ore.

Agenda item no. 04

Application for Consent to Operate (expansion) under the Air Act and the Water Act of M/s. Glenmark Pharmaceuticals Limited, located at Plot No.S-7, Colvale Industrial Estate, Colvale Bardez Goa

The Member Secretary informed the members M/s.Glenmark Pharmaceuticals Limited, had submitted a proposal for increase in production from 640 million per annum by 15 million per month. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s.Glenmark Pharmaceuticals Limited, located at Plot No.S-7, Colvale Industrial Estate, Colvale Bardez Goa for Consent to Operate (expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no. 05

Application for Consent to operate (expansion) under the Air Act and the Water Act of M/s IFB Industries Limited, located at Plot no. L-1, Verna Industrial Estate, Verna, Salcete Goa.

The Member Secretary informed the members that M/s IFB Industries Limited, had submitted a proposal for manufacture of new product cloth dryers of 2500 nos./annum. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction

of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s IFB Industries Limited, located at Plot no. L-1, Verna Industrial Estate, Verna, Salcete Goa for Consent to operate (expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no.06

Application for Consent to Operate (Shifting of existing plant from Kundaim Industrial Estate to Navelim, Bicholim) under the Air Act and the Water Act of M/s Mohit Ispat Ltd., located at Plot no. 01, Navelim Village, Under Bicholim Industrial Estate, Bicholim, Goa.

The Member Secretary informed the members that Mohit Ispat Ltd., had submitted a proposal for manufacture of MS Ingots to MS Billets of sanctioned capacity 48000 MT per annum. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

Member, Dr.Pramod Sawant, objected to the grant of Consent stating that the existing unit is causing pollution and there is allegation that the said unit is disposing waste into the nallah and hence the application should only be considered after verification of the compliance of the existing unit.

Agenda item no. 07

Application for Consent to Establish (Expansion) under the Air Act and the Water Act of M/s. Belladona Plasters Limited, located at Survey No 134 & 137, Nirancal, Curti, Ponda, Goa.

The Member Secretary informed the members that M/s. Belladona Plasters Limited, had submitted a proposal for increase in production of first air dressings, plaster of paris bandage, adhesive and medical tapes from 5000000m2/month by 12500000m2/month. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Belladona Plasters Limited, located at Survey No 134 & 137, Nirancal, Curti, Ponda, Goa, for Consent to Establish (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no. 08

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Guala Closures (India) Pvt. Ltd., located at Survey No 60/2 (Part) & 40/0(Part), Upper Harvalem, Sanquelim, Bicholim, Goa.

The Member Secretary informed the members that M/s. Guala Closures (India) Pvt. Ltd. had submitted a proposal for increase in production of Non Refillable closures from 19 millions/month to 26.876 millions/ month and increase in production of Nipcapes from 60 million/month to 99.45 million/ month.. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

Member, Dr.Pramod Sawant, stated that local residents had complained against the unit.

The members approved the proposal of M/s. Guala Closures (India) Pvt. Ltd., located at Survey No 60/2 (Part) & 40/0(Part), Upper Harvalem, Sanquelim, Bicholim, Goa, for Consent to Operate (Expansion) under the Air Act and the Water Act subject to conduct of inspection and for verification of compliance of the existing activity. The unit also has to obtain approval from the Goa Investment Promotion and Facilitation Board.

Agenda item no. 09

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Vergo Pharma Research Laboratories Pvt. Ltd., located at Plot No B5, B22,B23 & B23A, PHASE-1A, Verna Industrial Estate, Verna Salcete-Goa

The Member Secretary informed the members that M/s. Vergo Pharma Research Laboratories Pvt. Ltd.had submitted a proposal for manufacturing of tablets/ capsules of 40 lakh/annum and liquids of 2200 lts/ annum. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Vergo Pharma Research Laboratories Pvt. Ltd., located at Plot No B5, B22,B23 & B23A, PHASE-1A, Verna Industrial Estate, Verna Salcete-Goa for Consent to Operate (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge and obtaining approval from the Goa Investment Promotion and Facilitation Board.

Agenda item no. 10

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Merck. Ltd., located at Plot No 11/1, Marvasodo, Usgaon, Goa

The Member Secretary informed the members that M/s. Merck. Ltd.had submitted a proposal for increase in production of API from 636.4 MT/A to 1080MT/A. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

Member, Dr.Pramod Sawant, stated that there are complaints against the unit for non compliance.

The members approved the proposal of M/s. Merck. Ltd., located at Plot No 11/1, Marvasodo, Usgaon, Goa, for Consent to Operate (Expansion) under the Air Act and the Water Act subject to conduct of inspection and for verification of compliance. The unit also has to obtain approval from the Goa Investment Promotion and Facilitation Board.

Agenda item no. 11

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Aliaxis Utilities and Industry Pvt. Ltd., located at Plot No L-148 and L149, Verna Industrial Estate, Verna, Salcete-Goa

The Member Secretary informed the members that M/s. Aliaxis Utilities and Industry Pvt. Ltd has submitted a proposal for Increase in production of plastic injection moulded pipe fitting and coupling from 10 lac/annum to 30 lac/aanum. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Aliaxis Utilities and Industry Pvt. Ltd., located at Plot No L-148 and L149, Verna Industrial Estate, Verna, Salcete-Goa
, for Consent to Operate (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no.12

Application for Consent to Establish (Expansion) under the Air Act and the Water Act of M/s. Watson Pharma Pvt. Ltd., located at Plot No A3 to A-6, Phase 1A, Verna Industrial Estate, Verna, Salcete-Goa

The Member Secretary informed the members that M/s. Watson Pharma Pvt. Ltd., had submitted a proposal for increase in production of tablets and capsules from 6000millions/annum to 8000millions/annum. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Watson Pharma Pvt. Ltd., located at Plot No A3 to A-6, Phase 1A, Verna Industrial Estate, Verna, Salcete-Goa for Consent to Establish (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge and obtaining approval from the Goa Investment Promotion and Facilitation Board.

Agenda item no.13

Application for Consent to Establish (Expansion) under the Air Act and the Water Act of M/s. Shirdi Steel Re-rollers Pvt. Ltd., located at Plot No A3 L-8 to L-9, Cuncolim Industrial Estate, Cuncolim, Salcete-Goa

The Member Secretary informed the members that M/s. Shirdi Steel Re-rollers Pvt. Ltd., had submitted a proposal for manufacture of galvanised tubes and pipes. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Shirdi Steel Re-rollers Pvt. Ltd., located at Plot No A3 L-8 to L-9, Cuncolim Industrial Estate, Cuncolim, Salcete-Goa
for Consent to Establish (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no.14

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Goa State Co-operative Milk Producer's Union Ltd., located at Survey No 79/1, Curti Ponda, Goa

The Member Secretary informed the members that M/s. Goa State Co-operative Milk Producer's Union Ltd Ltd., had submitted a proposal for production of ice-creams-26000 ltrs/month. The proposal was approved by the Technical Advisory Committee of the Board, which recommended for placing the proposal before the Board.

The members noted that the unit has to make provisions for rain water harvesting and re-charging of wells, within their premises, so as to recharge the ground water aquifer, which has been

depleted. The members observed that the applicant unit may be required to take permission from the Ground Water Officers appointed under the Goa Ground Water Regulation Act, 2002, for construction of bore wells or utilization of the ground water in the area.

The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resource Department for scrutiny and approval.

The members approved the proposal of M/s. Goa State Co-operative Milk Producer's Union Ltd., located at Survey No 79/1, Curti Ponda, Goa for Consent to Operate (Expansion) under the Air Act and the Water Act subject to implementation of rain water harvesting and ground water recharge.

Agenda item no.15

Application of the Department of Science, Technology and Environment for

Consent to Operate for commencing operations of the Solid Waste Management Facility at Calangute/ Saligao at Survey No.47/1 (P) of Saligao Village, Bardez Taluka.

The Member Secretary informed the members that the Department of Science, Technology and Environment has submitted an application under the Air Act, Water Act and Authorization under the Hazardous Waste Rules for commencing operations of the Solid Waste Management Facility at Calangute/ Saligao. The Member Secretary informed that the area of the site is 121580 sq.mtrs. (113500 sq.mtrs. in Calangute Village and 8080 sq.mtrs. in Saligao Village).

The Member Secretary informed the members that there was Petition before the Hon'ble National Green Tribunal which has been disposed off by the Hon'ble National Green Tribunal with various conditions for compliance which includes remediation/ bio mining of the existing dump waste within a period of 2 months, covering of existing dump waste during monsoon, operation of plant for a capacity 100 tons/day as provided in Environmental Clearance and the Board should not grant Consent until the land fill site is ready for commissioning.

The Member Secretary informed that the landfill site is ready for commissioning and Consent to Operate for a trial basis for a period of 6 months may be considered with a condition to comply with the Hon'ble National Green Tribunal order with regards to screening /remediation/ covering of existing dump during monsoon.

The members approved the proposal of the Department of Science, Technology and Environment for Consent to Operate for commencing operations of the Solid Waste Management Facility at Calangute/ Saligao at Survey No.47/1 (P) of Saligao Village, Bardez Taluka on trail basis for six months.

Consent to Operate for Screening and Remediation at Calangute/ Saligao at Survey No.47/1 (P) of Saligao Village, Bardez Taluka .

The Member Secretary informed the members that the Screening and remediation of existing dump is proposed as per the recommendation made by the Expert Committee Recommendation constituted by Goa State Infrastructure Development Corporation comprises of the following members,

Dr. Sharad Kale : Chairman
Dr. A.N.Vaidhya : Member
Dr. Mahendra Patil : Member
Dr. Srikanth Mutnuri : Member
Shri. Domnic Fernandes : Member
Shri. Sandip Chodnekar : Member Secretary

This activity has to be carried out to comply with the order issued by the Hon'ble National Green Tribunal. The members approved the proposal of the Department of Science, Technology and

Environment for Consent to Operate for screening /remediation/ covering of existing dump during monsoon at Calangute/ Saligao at Survey No.47/1 (P) of Saligao Village, Bardez Taluka on trail basis for six months with a condition to comply with the Hon'ble National Green Tribunal order and to also ensure that the dump is adequately covered during monsoon to prevent flow of leachate.

Agenda item no. 16

Categorization of Industries.

The Member Secretary explained to the members that the Central Pollution Control Board had issued directions under section 18 (1) of the Water (Prevention and Control of Pollution) Act, 1974 directing all the State Pollution Control Boards to implement the revised classification of industrial sectors as recommended by the Working Group set up for this purpose and to maintain uniformity in categorization of industries across the countries. He informed that the Working Group had developed the criteria of categorization of industrial sectors based in the Pollution Index which is a function of the emissions (air Pollutants), effluents (water pollution), hazardous wastes generated and consumption of resources.

He further stated that the Central Pollution Control Board had directed the State Pollution Control Boards and Pollution Control Boards to revise/ prepare the inventory of Red, Orange , Green and White categories of industries operating in the Jurisdiction based on the revised criteria specified in the Final Report and to submit the same to Central Pollution Control Board within 90 days i.e. before 30/5/2016.

The members decided to adopt the categorization as directed by the Central Pollution Control Board and also forward the same to the Department of Environment with a request to suitably amend the Goa Water and Air Rules after obtaining approval of the State Government.

Agenda item no. 17

Implementation of the Enforcement Policy

The Member Secretary informed the members that an Application No.30 of 2013 (Shri.Vinesh M.Kalwal V/s. State of Maharashtra and 3 others) was filed before the Hon'ble National Green Tribunal (Western Bench) dated 16/5/2014. He stated that the Maharashtra Pollution Control Board has framed an Enforcement Policy in consultation with the Central Pollution Control Board, NEERI, Representative of Gujarat Pollution Control Board and Tamil Nadu Pollution Control Board. The Enforcement Policy emphasis on the following;

Refusal/ Revocation of the Consents and Forfeiture of Bank Guarantee.
Integrated approach for Consent Management.
Sectors-Specific Approach for Consent Management.
Stringent Conditions for Pollution Prevention.
Target for securing sector-specific compliance.
Implementation of Polluter Pays Principle.
Definition of specific violations into average, medium, substantial compliance and Categorization of violations.
Specific Actions in case of serious violations.
Conditions for Remediation/ Restoration to be incorporated/ imposed for damage caused to the environment in Consents/ Directions of Defaulting Industries.
Enforcement of compliance of various environmental norms through various actions under the provisions of environmental laws (Violations and Actions):
Show Cause Notice,
Warning notice,
Proposed Directions
Conditional Directions
Conditional Direction
Filing of prosecution

He further stated that the said Enforcement Policy has been notified by Maharashtra Pollution Control Board in the Gazette Notification dated 29th February 2016.

After discussion, the Chairman of the Board suggested to constitute a Committee comprising of;
The Director of Tourism.
The Director of Mines and Geology.
Mr. Levinson J.Martins, Member Secretary of Goa State Pollution Control Board.
Mr. Sanjeev Joglekar, Environmental Engineer, Goa State Pollution Control Board.
to adopt a similar Enforcement Policy for including other issues which are specific to this State.

However as far as the inspection report format is concerned. Since the Hon'ble National Green Tribunal has issued direction in Application No.223/2015 in Ram Shyama Paper Limited V/s. Smt. Sunaina Singh and others and M.A.239 of 2016 in Appeal No.10 of 2016 and M.A No.240 of 2016 in Appeal No.11 of 2016 in the matter of M/s. Sun Max Auto Engineering Pvt. Ltd. V/s. State of Uttarakhand and AMG Industries Ltd. V/s. Uttarakand Environment Protection Pollution Control Board., the Board decided to adopt the format as directed by Hon'ble National Green Tribunal and strictly comply with the same.

Agenda item no.18

Adoption of Guidelines for hot mix plants of the Gujarat Pollution Control Board.

The Member Secretary informed the members that the standard for emission and effluents discharge as well as guidelines has been stipulated in the Environment (Protection) Rules. He stated that there are no specific guidelines for hot mix plants in the Environment (Protection) Rules and it is seen that Gujarat State Pollution Control Board has adopted guidelines for hot mix plants. The guideline of Gujarat Pollution Control Board for hot mix plants includes criteria for hot mix plants and also air pollution control measures and safety measures for hot mix plants.

The Members decided that the Committee proposed to be constituted to study the Enforcement Policy could also look into the said guidelines and suggest modification/ changes to suite the local authorities.

Agenda Item No.19

Policy decision with regard to operation of STP with minimum 5 years from commencement of operation, by the builder.

The Member Secretary informed the members that in case of residential complexes, the builder transfers the operation and maintenance of Sewage Treatment Plant in the society. On most occasions it is found that the Sewage Treatment Plant is not working efficiently or on some occasions it is not operational at all. To ensure that the Sewage Treatment Plant is operated and maintained, so as to meet the standards prescribed in the Consent to Operate issued by the Board.

After discussion and deliberation, the members decided to incorporate the condition suggested in the Consent for operation of Sewage Treatment Plant by the builder for a period of 5 years from the date of obtaining occupancy certificate and also to send communication to the Chief Town Planner to examine for inclusion of similar condition to their permission and necessary amendment to the building by laws by the State.

Agenda Item No.20

Reports on Monitoring of Mormugao Port Trust

The Member Secretary informed the members that the Ambient Air Quality monitoring has commenced. The Board members were further briefed about the monitoring/ study so far and the need to extend the Ambient Air Quality monitoring Station upto 31st May 2016. Further action will be initiated based on the report on the comprehensive study being carried out. The members approved the same.

Agenda Item No.21

Award of contract for carrying out electrical work for the proposed laboratory building.

The Member Secretary informed the members that the Board had floated an e-tender for carrying out electrical work based on the estimate submitted by the consultant amounting to Rs.20932130.00. At the first call of the tender there was no response hence the date was extended. He stated that thereafter two agencies quoted for the tender. M/s. Goa Friend's Engineering & Electricals Pvt. Ltd. quoted an amount of Rs.25870594.00 which was 23.59 percent of the estimate cost and 4.81 percent reasonable amount. Negotiation was carried out with M/s. Goa Friend's Engineering & Electricals Pvt. Ltd. and after negotiation the quoted amount of M/s. Goa Friend's Engineering & Electricals Pvt. Ltd. is 25085594.00 which is 19.84 percent of the estimate cost and 1.63 percent reasonable amount. He further stated that the work has been awarded to M/s. Goa Friend's Engineering & Electricals Pvt. Ltd. to ensure the smooth continuity work as well as civil work has reached first floor slab level.

Members deliberated and approved the same.

Agenda Item No.22

Request made from Highbar Technology Limited for compensation due to delay of implementation of SAP in the Board due to non-availability of servers.

The Member Secretary informed the members that the Board was in receipt of a comprehensive request from M/s. Highbar Technology Limited for implementation of SAP and the said compensation request has been claimed for the delay attributed to the Board and under clause No.23.1 and 23.2 (Article 23 Change of scope of work) of the contract agreement dated 23rd December 2014 between Goa State Pollution Control Board and M/s. Highbar Technology Limited..

The compensation request made by M/s. Highbar Technology Limited is for the following;

The salary for the staff required to be deputed for a period of 3 months for implementation of Software.

Rental of the premises for additional period of 3 months.

Rental of laptop.

The salary for the staff required to be deputed for a period of 3 months working offside in the premises.

The total amount of compensation request for a period of 3 months is Rs.3440000/-.

The Member Secretary expressed that he is of the opinion that though compensation request has to be paid in view of delay in obtaining/ purchasing the servers by following all the codel formalities. The amount of compensation has to be examined by the core committee constituted earlier.

The Members deliberated and decided that the core committee should examine the compensation and should place their views and recommendation before the Board.

Agenda Item No.23

Payment of professional fees and other allowances to the Government Advocates/ Additional Government Advocates appearing in the High Court of Bombay at Goa.

The Member Secretary informed the Members that the Department of Law and Judiciary vide order dated 18/01/2016 has been modified the existing terms and conditions towards the payment of professional fees and other allowances to the Government Advocates/ Additional Government Advocates appearing in the High Court of Bombay at Goa, for defending the interest of the State Government, in the matters concerned and that it be adopted by the Board.

The Members approved for payment of professional fees and other allowances as provided in

the order issued by the Under Secretary, Law Department No.1/19/2015/LD(Estt.)/150 dated 18/1/2016 in the Terms and Conditions.

Agenda Item No.24

Schedule of sampling and Analysis charges for environmental samples

The Members Secretary informed the members that the Board is conducting monitoring under Air Act and Water Act , collection of water sample, air sample, stack emissions etc. of the complaints received/ inspections. During the process the expenditure incurred by the Board be received from the unit/ complainant/ Municipalities/ Government Department etc. This monitoring is carried out pursuant to receipt of complaints as well as non-compliance received from the industries. Water sample, air sample is also conducted on request of general public. He also informed the members that the Central Pollution Control Board has notified fees for carrying out collection and analysis of samples and the same needs to be forwarded to the State Government for notification.

Similarly fees have also to be charged to Municipal Corporations, Village Panchayats, Semi-Governments/ Autonomous Corporations of the State Government.

The members deliberated and decided to implement and charge the fees as prescribed and also forward the same to the State Government for notification and suitable Goa Water and Air Rules.

Agenda Item No.25

Approval of the Revised Budget Estimates of the Goa State Pollution Control Board for the financial year 2015-2016 and Budget Estimate's of the Board for the financial year 2016-2017.

The members perused the Revised Budget Estimates of the Goa State Pollution Control Board for the financial year 2014-2015and Budget Estimate's of the Board for the financial year 2015-2016, which was placed before the Board as per section 38 of the Water (Prevention and Control of Pollution) Act, 1974, prepared in Form VI and VII, prescribed in Rule 31.

The Accounts cum Administrative Officer of the Board gave a detailed account of the proposed Budget.

The Member Secretary explained to the members that the present fees which are been levied for processing application for Consent to Establish/ Consent to Operate under the Water and Air Act were notified in the year 1998. Thereafter the fees have not been increased, however the validity period of Consent for Red, Orange and Green Category industries has been increased upto 5,7 and 10 years respectively for small and medium scale enterprises.

Similarly the Board is collecting only fee from those industries that have been operating in the past without Consent of the Board as decided by the Board from time to time. This has been resulted in loss of revenue to the Board and the Budget of the Board is a deficient budget primarily due to expenditure to be incurred for the construction of laboratory cum office building of the Board i.e. Rs. 25 crores.. The Member Secretary also informed the member that the revenue generated from collection of Consent fee is less than the expenditure incurred for the salaries and other expenditure incurred by the Board.

The Accounts cum Administrative Officer of the Board informed that there is a shortfall of collection in the range of 30-50 lakh rupee a month. The Members deliberated and noted that the fees have not been increased since 1998 and the validity of the Consent has been increased and hence decided that the committee constituted for studying the Enforcement Policy, guidelines for hot mix plants should look into this aspects and suggest an appropriate hike in the fees to bridge the gap between Consent fee collection and the expenditure incurred by the Board.

Table item no.1
Exemption of DG sets upto 1MVA from seeking consent of the concerned SPCB/PCC

The Member Secretary noted that the Central Pollution Control Board has issued directions under section 18(1) of the Water and Air Act which is a statutory directions and this matter has been discussed and approved for adoption in item pertaining to categorization of industries. Therefore the Members approved to exempt the DG Sets having less than 1 MVA DG sets for obtaining Consent under the Air Act.

Table item no.2
Re-appointment of Dr.Joe D'souza, retired Professor in Microbiology (Goa University)

The Member Secretary informed the members that the Board in its 118th Board meeting had approved for re-appointment of Dr. Joe D'Souza, retired Professor in Microbiology (Goa University) on contract basis in Goa State Pollution Control Board as a Consultant Scientist, to assist the officials of the GSPCB and associate himself with the Japan International Corporation Agency Project officials, on a consolidate monthly remuneration of Rs.21,200/- for a period of 1 year from 4th June 2015 to 3rd June 2016.

The Member Secretary informed the members that the Japan International Corporation Agency Project have been completed. However to guide the Board in its other activities, including St. Inez Creek matter etc. and it is proposed to re-appoint Dr. Joe D'Souza for a further period of 1 year w.e.f. 4th June 2016 to 3rd June 2017 with 3% increase that is Rs.21,850/- per month.

The members noted and approved the appointment.

Table item no.3
Regarding the banning of usage of charcoal for industrial/commercial purpose.

The member Secretary informed the members that the Board was in receipt of letter from the Dy. Conservator of Forests, Panaji requesting to forward comments in the matter of Original Application No.498/2014 (Indian Institute of Sustainable Development V/s. Union of India and Ors.) before the Hon'ble National Green Tribunal, Principal Bench, New Delhi. The issues raised in the petition are regarding the banning of usage of charcoal for industrial/ commercial purpose.

The petition is filed in the National Green Tribunal with a prayer to impose a complete ban on usage of charcoal for commercial and industrial purpose and monitor and examine illegal consumption of charcoal in commercial and industrial purpose in the country.

Accordingly the Board has issued Directions/ Show Cause Notice to industries manufacturing charcoal to stop manufacturing charcoal and those units using charcoals to shift to alternative fuel.

M/s. Gopika Wood Industries has replied to the Show Cause Notice dated 15/4/2016 stating that they utilize leftover firewood derived after cutting the fully matured timber trees to manufacture charcoal and have obtained valid license from the Forest Department to fell the trees.

The members sought to know the details as per how many industries were utilizing charcoal and the industries manufacturing charcoal.

The Member Secretary informed the members that 6 no. of industries were identified which were utilizing charcoal and notices were issued accordingly out of which 2 no. of industries have been informed that they are not utilizing charcoal.

The members deliberated and decided that the necessary information of industries/ agencies

permitted to manufacture charcoal should be obtained from the Forest Department and so also the source of raw material (wood) should be ascertained. In case the operation does not involve in cutting of trees and the charcoal is manufactured the operations could be permitted to be continued. In the event the operations entail in last scale felling of trees the Board should not permit continuous of operation. The Members also observed that there are very few industries utilizing charcoal as raw material and hence the same could be permitted to operate and the quantum of charcoal utilized is in small quantity.

The members noted and approved for appropriate action by the Board to be taken.

III. The meeting ended with thanks to the Chair.

121st Meeting of The Board
In the 121st Meeting the Board took the following decisions:

Agenda Item no. 01
Confirmation of the minutes of the 120th meeting of the Goa State Pollution Control Board held on 28th April, 2016.

The members perused and confirmed the minutes of 120th meeting of the Goa State Pollution Control Board held on 28th April, 2016, so as to enter the same in the minutes book.

Agenda Item no. 02
Follow up action on the decision taken at the 120th meeting of the Board held on 28th April, 2016.

Agenda item no. 3 – The members noted that the consent to operate to mining units - Consents to be issued to M/s Rajaram Bandekar (Sirigao) Mines Pvt. Ltd., M/s Madachem Bat Mines Pvt. Ltd. and M/s Gajanan S. Padiyar.

Agenda item no. 4 - The members noted that the consent to operate (expansion) has been issued to M/s Glenmark Pharmaceuticals Ltd., Colvale Indl. Estate.

Agenda item no. 5 – The members noted that the consent to operate (expansion) has been issued to M/s IFB Industries Limited, Corlim Indl. Estate.

Agenda item no. 7 – The members noted that the consent to operate (expansion) has been issued to M/s Belladona Plasters Limited, Ponda Goa.

Agenda item no. 8 – The members noted that the inspection of M/s Guala Closures (I) Pvt. Ltd. for Consent to Operate (expansion) has been granted. The domestic waste water generated will be treated in existing STP. The existing and proposed domestic waste water will be treated in this STP. The solid waste and Hazardous waste generated are disposed as per norms.

Agenda item no. 9 – The members noted that the Consent to Operate (expansion) of M/s Vergo Pharma Research Laboratories Pvt. Ltd. is under process.

Agenda item no. 10 –The members noted that the fresh inspection of M/s. Merck Ltd., Usgaon has been conducted and the inspection report indicated that the unit complying with the norms and the application is under process.

Agenda item no. 11 – The members noted that the Consent to Operate (expansion) has been issued to M/s Aliaxis Utilities & Industry Pvt. Ltd., Verna Indl. Estate.

Agenda item no. 12 – The members noted that the Consent to Establish (expansion) to M/s Watson Pharma Pvt. Ltd., Verna Indl Estate is under process.

Agenda item no. 13 – The members noted that the Consent to Operate (expansion) has been issued to M/s Shirdi Steel Re-Rollers Pvt. Ltd., Cuncolim.

Agenda item no. 14 –The members noted that the Consent to Operate (expansion) to M/s Goa State Co-operative Milk Producers Union Ltd., Ponda is under process.

Agenda item no. 15 – The members noted that (a) Consent to Operate for the Solid Waste Management Facility at Calangute / Saligao and (b) Consent to Operate screening and remediation at Calangute / Saligao has been granted.

Agenda item no. 17 and 18:

The members perused the reports submitted by Sub Committee with regard to the implementation and formulation of enforcement policy review of hot mix plants and review of fees for Consent and decided to adopt the recommendations made by the Sub Committee for implementation of enforcement policy as modified for the requirement of the State Pollution Control Board, including the guidelines for hot mix plants.

It was explained that after the increase in validity of the Consent for green, orange category industries the fee collection has reduced and the expenditure is continuously increasing.

The members noted that the sub-committee has perused the recommendations made by the earlier Sub Committee in year 2009 for revision of the fees and has recommended that the present fee notified should be made as annual fee. The Member Secretary clarified that on implementation of this fee the income through Consent fee of the Board is likely to be in range of 10 to 12 crores, per annum and would be sufficient to meet the expenses of the Board, time being.

It was informed to the members that the validity of the consent for green, orange and red would be the same as the same notified by the State Government while amending the Goa Water and Air Rules in the year 2011.

The Chairman and the Principal Chief Conservator of Forest both were of the opinion that the proposed fee hike is insufficient and needs to be relooked by the Sub Committee Shri. Shrirang Jamble, member expressed that the Board requires to reconsider its earlier decision of waiver of past fees for industries operating without the Consent of the Board.

The members after due deliberations decided to adopt the guidelines of the hot mix pant as recommended by the Sub Committee, implement the auto renewal policy for orange and green category industries on self certification, refer the enforcement policy to the department of industries and tourism department, GIDC etc and seek their comments within 30 days and ask the Sub Committee to examine the fee structure afresh based on available records of red , orange and green large, medium and small industries operating in the state so that the revenue generation should be sufficiently increased to meet the requirement of the board for the next five years atleast.

Agenda item no. 19 - The monitoring has been completed and the report is under preparation.

Agenda item no. 21 – The members noted that the work order for carrying out electrical order has been issued for the proposed office and laboratory building at Saligao.

Agenda item no. 22 - The members noted that the proposal for constitution of a Core Committee is under constitution.

Agenda item no. 24 – The members noted that the schedule of sampling and analysis charges for environmental samples is under process.

Agenda item no. 25 – The members noted that the revised Budget Estimate for the financial year 2015-2016 and Budget Estimates for the financial year 2016-2017 have been forwarded to the Director, Dept. of Environment.

Table item no. 2 - The members noted that the letter is forwarded to Dr. Joe D'Souza conveying the extension of his contract and his acceptance to take over the job for a further period of one year.

Agenda item no.3
Discussion on the deferred item of the 120th Board meeting

a. Application for Consent to Operate (Shifting of existing plant from Kundaim Industrial Estate to Navelim, Bicholim) under the Air Act and the Water Act of M/s Mohit Ispat Ltd., located at Plot no. 01, Navelim Village, Under Bicholim Industrial Estate, Bicholim, Goa.

It was informed that the application was placed before 120th Board meeting and the members had objected to grant of Consent stating that the existing unit is causing pollution and there is allegation that the said unit is disposing waste into nallah and hence application should be only considered after verification of compliance of the existing unit.

Accordingly, the unit was inspected on 20/05/2016 and it has been found that during the inspection the existing unit is complying to the norms. The applicant has to make provisions for rain water harvesting and recharging of wells, within premises, so as to recharge the ground water aquifer. The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resources Department for scrutiny and approval.

The members approved for grant of Consent to operate (Shifting of existing plant from Kundaim Industrial Estate to Navelim, Bicholim) under the Air Act and the Water Act of M/s Mohit Ispat Ltd., located at Plot no. 01, Navelim Village, Under Bicholim Industrial Estate, Bicholim, Goa subject to implementation of rain water harvesting and ground water recharge and that Consent to Operate of existing unit at Kundaim should be withdrawn, once Consent to Operate is given to new location.

Agenda item no. 04
Application for Consent to Establish under the Air Act and the Water Act of Mopa International Airport, located at Mopa, Pernem, Goa.

It was informed to the members that the Department of Civil Aviation, Goa has submitted an application for Consent to Establish for the Greenfield Airport at Mopa in Varconda, Ugvem, Chande, Casarvarnem and Ambrem in an area of 81,29,455 sq.mts, for passenger capacity of 9 million per annum. The Ministry of Environment and Forest and Climate Change has granted Environmental Clearance for the proposed Airport. The said environmental clearance has been challenged by non-governmental organizations and individual in the Hon'ble National Green Tribunal, Pune.

The members perused the details of the water requirement, waste water generation, proposed mode of treatment and reuse, air emissions and control measures solid and hazardous waste generation and decided to grant consent to establish for the said Greenfield Airport with condition that in the successful bidder will have to approach the Board in the event there are any changes in the treatment methodologies and generation of waste water and solid and hazardous waste.

Agenda item no. 05
Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Unichem Laboratories Ltd., located at Plot No 15,16,17,17A & 18, Pilerne Industrial Estate, Pilerne, Bardez-Goa.

It was informed to the members that M/s Unichem Laboratories Ltd has submitted application for Consent to Operate (expansion) for Increase in production from 2400million tablets to 7400 million tablets/capsules per annum i.e. a net increase by 5000million tablets/capsules per annum. The proposal has been recommended by the Technical Advisory Committee of the Board for placing the proposal before the Board.

The applicant has to make provisions for rain water harvesting and recharging of wells, within premises, so as to recharge the ground water aquifer. The members suggested that the unit should submit their plans for rain water harvesting and re-charge of wells along with designs to the Water Resources Department for scrutiny and approval.

The members approved the proposal of M/s Unichem Laboratories ltd for Consent to Operate (Expansion) under the Waster and Air Act for increase in production of capsules and tablets subject to implementation of rain water harvesting and ground water recharge.

Agenda item no. 06

Application for Consent to Operate (New) under the Air Act and the Water Act of M/s. Varun Beverages Limited located at Sanguem Industrial Estate, Sanguem, Goa.

The members were informed that M/s Varun Beverages Ltd located at Sanguem Industrial Estate has submitted an application for Consent to Operate (New) for production of Packaged drinking water quantity 2295000 nos. and Pet CSD 1785000 nos. The proposal has been recommended by the Technical Advisory Committee to be placed before the Board.

The Chairman and the members enquired about the source of the water proposed by the Industry. The Member Secretary informed the members that earlier cases the approval of the HPCC considered this aspect with comments of the Water Resources Department and the Public Works Department and the Board granted Consent after HPCC approval.

The members decided to that the details of the water source should be sought from the Industry and thereafter the application should be placed before the next Board meeting .

Agenda item no. 07

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Rukminirama Steel Rollings Pvt. Limited., located at Plot No. L-26, Cuncolim Industrial Estate, Cuncolim, Salcete – Goa.

The members were informed that the Board is in receipt of the application for Consent to Operate(Expansion) under the Air Act and the Water Act of M/s. Rukminirama Steel Rollings Pvt. Limited., located at Plot No. L-26, Cuncolim Industrial Estate, Cuncolim, Salcete – Goa for from 28800 MT per annum (i.e. 2400 MT per month) to 54000 MT per annum. i.e. a net increase by 29600 MT per annum and addition of adjacent plot number L-25 to the existing premises.

The proposal has been recommended by the Technical Advisory Committee to be placed before the Board.

The members noted that the additional water requirement is 30 KL/month and the present requirement is 300 KL/month and sought to know the source of water and also details of the septic tank and soak pit and the disposal of the sewage from the septic tank and soak pit.

The Members decided that the application should be placed before the Board in the next meeting with details as mentioned above.

Agenda item no. 08

M/s. Vani Agro Farms Pvt. Ltd. (Distillery unit) Survey no 81/2-A, Sanguem – Goa.

The members were informed that the Board is in receipt of a letter from `The Goa Foundation` dated 10/05/2016 stating that the Consent to Establish issued to M/s. Vani Agro Farms Pvt. Ltd. (Distillery unit) is seriously defective and needs to be withdrawn for the reasons as under:

i.	Consent to Establish at Sr. No. 2 mentions production of extra neutral alcohol at 26.5 litres/ month and Impure spirit 1.5 litres/month
ii.	However, the daily quantity of industrial effluent is permissible upto 350 KLD (kilo litres per day)
iii	The effluent treatment plant capacity permissible upto 550 KLD
iv.	They have also stated that the Board had already in a resolution passed, decided to accept the zoning atlas prepared for the State of Goa, which does not permit Red category industries anywhere in the State.

It was then informed to the members that the Board is also in receipt of a letter from M/s. Vani Agro Farms Pvt. Ltd. dated 26/05/2016 requesting to issue Consent to Establish according to the In-principle approval granted by Goa Investment Promotion and Facilitation Board (Goa-IPB) on 10/02/015.

The members perused the details and since apparently it appears to be a typing error and has continued from the mistake made in the application of the unit. The waste water generation in the application is 350 kilo litres per day and commensurate with the production of 26.5 kilo litres per day of extra neutral alcohol and 1.5 kilo litres per day of impure spirit. These figures also match with the quantity mentioned in the EIA report i.e 28 KLD. The unit has also has submitted that there will be zero effluent discharge, including Environment Management Plan.

It is decided to issue amendment to the Consent to Establish issued earlier as sought by the applicant and also intimate the above facts to the Complainant.

Agenda item no. 09

Constituting of Panel of Advocates to appear on behalf of the GSPCB before various Courts of Law and Judicial Forums and Tribunals:

The Board is a party to a number of Court cases before various Courts and Judicial Forums including the Supreme Court of India, the High Court of Bombay, the High Court of Bombay at Goa, the Principal Bench of the National Green Tribunal at New Delhi, the Western Zone bench of the National Green Tribunal at Pune, the Administrative Tribunal at Panaji, the Civil and Criminal Courts in the State, the Human Rights Commission etc.

In this regard it is imperative that the Board retains Advocates to appear on its behalf in these matters and defend its interests.

The Board at its 106th meeting held on 11/2/2013 had constituted a panel of Advocates to appear on its behalf along with the fee structure and terms and conditions of appointment.

Presently as the number of cases that the Board is a party to has increased and as the Judicial Forums before which the Board is required to appear have also increased including appearances before Judicial Forums outside the State at Pune, Bombay and New Delhi.

In light of the above it is proposed as follows:

Proposed Panel of Advocates to appear on behalf of the GSPCB before various Courts of Law and Judicial Forums and Tribunals:

It was informed to the members that the Senior Counsel of the Board. Shri A.N.S. Nadkarni has been appointed as the Additional Solicitor General of India and has informed him that he would continue

to represent the Board in its matters before various Courts . However as he is now based in Delhi the Board may require to appoint a Senior Advocate in case of exigency to represent the Board in the Hon'ble Court of Bombay at Goa and Hon'ble National Green Tribunal in Pune .

The members deliberated on the issue and decided that the Board in such circumstances consult Senior Counsel Atmaram Nadkarni, as he is the Counsel of the Board for almost ten years and decide the appointment based on his recommendation

The Member Secretary informed the Board that the State Government as notified the fees to be paid to the other Advocates in terms of the para 1 of the Order bearing no. 1/19/2015LD(Estt.)/1501, dated 18/01/2016 issued by the Department of Law and Judiciary, Law(Establishment) Division, Government of Goa and the Charges claimed by Advocates towards travelling expenses including food and accommodation expenses shall be decided in terms of para 2(C) of the Order bearing no. 1/19/2015LD(Estt.)/1501, dated 18/01/2016 issued by the Department of Law .

The members decided to adopt the orders of the State Government for payment of fees and other claims to other advocates representing the Board and intimate the other lawyers representing the Board as recommended by the Senior Counsel, Shri Atmaram Nadkarni.

This decision is taken in supersession of all earlier decisions of the Board taken on these subjects.

Agenda item no. 10
Present status of the construction of the Board building at Saligao.

It was informed to the members that the slab of the 2nd floor of the proposed Laboratory cum office building of the Board is cast an tenders for light, fire fighting, sewage treatment plant etc will be floated shortly.

The Chairman enquired regarding the expected date of completion of the proposed Building. The Member Secretary clarified that the Building is expected to be completed by March, 2017. The members noted the same.

Agenda item no. 11
Discrepancy in Seniority list of the Scientific Assistants.

It was informed to the members that Mrs. Anny Dias, Scientific Assistant of the Board has submitted a representation to the Board that Seniority list of the Scientific Assistants issued in the year, 2011 is not as per the merit list of the selection made by the Department Selection Committee during the appointment made in 2007.

It was also informed to the members that the original minutes of the meeting of the Department Selection Committee and marking scheme of the Selection made for the post of the Scientific Assistant is not traceable in the Board however a photocopy of the same is found.

Mrs. Anny Dias has now made a representation to the Board stating that as per the photocopy of the minutes of the Departmental Selection Committee held on 12/03/2007, she stands first on the merit list and ought to have listed at serial no. 3 in the Seniority list, whereas the official is listed at serial no 5 of the Seniority list. She has further requested for review of the Seniority list of 11/01/2011.

The Member Secretary informed the members that based on the seniority list issued in the year 2011, Shri Nilesh Parsekar was appointed on the post of Scientist 'B'on Ad hoc basis and the appointment expires on 01/08/2016.

The Chairman stated that the official first as per DSC list should be considered as the senior. The members after due deliberations decided that Board should re-constitute the records after authentication by the then DSC Committee and take further course of action as per the Service Rules, to re-cast the seniority.

Agenda item no. 12
Delegation of Powers.

The members were informed that the Power to obtain information under section 20 of the Water Act and 25 of Air act , Power of entry and inspection under section 23 of water act and section 24 of air act, power to take samples of effluents and emissions under section 21 of water act and section 26(1) of air act and power to conduct inquiry under section 25(3) of water act and section 21 of air act, power to issue refuse withdraw and vary consent under sections 25, 26 and 27 of water act and section 21 of air act lies with the State Boards or the officer empowered by the Board.

It was further informed to the members that Under Rule 18(8) all orders or instructions to be issued by the Board shall be over the signature of the Member Secretary or any other officer authorized in his behalf by the Chairman.

The Chairman informed the members that during the meeting of Chairmen and Member Secretaries of various states organized by the Central Pollution Control Board it has been noticed that For better operation and smooth functioning of the board various state pollution control boards have issued circulars delegating these powers to various officials which include Kerala, Karnataka, Tamil Nadu, Maharashtra etc. Other powers that is powers to issue authorization under the Hazardous Waste Rules, Bio-medical Waste Rules, E-waste Rules, Plastic Waste Batteries Management are also being delegated to various officials. The State Pollution Control Boards have also delegated powers with regards to certifying analysis reports, issuing salary certificates, work orders, returning of BG purchase orders etc have also being delegated at various levels.

The members after due deliberations decided to delegate the powers as follows:-

Sr. No	Description	Delegation of Powers
1	Power to obtain information under section 20 of the Water Act and 25 of Air act	Technical-CTO related – EE Scientific-CTO related – senior most Scientist C
2	Power of entry and inspection under section 23 of water act and section 24 of air act	Senior most JEE- shall be incharge of inspection scheduling and all respective JEE, All SA, JLA, SLA, Scientist and Engineers of allotted Talukas will have powers to inspect under Section 23 and 24 of Water and Air Act respectively.
3	power to take samples of effluents and emissions under section 21 of water act and section 26(1) of air act	Scientist C-
4	power to conduct inquiry under section 25(3) of water act and section 21 of air act	EE- Technical related Scientist C
5	Power to issue, refuse, withdraw and vary consent Section 25, 26 and 27 of water act and section 21 of air act	

	Green Category Enterprises	Small and Medium:- Scientist C- Large:- EE
	Orange Category Industry	Small and Medium:- Scientist C Large:- EE
	Red Category Industry	
	• Small – renewal	Member Secretary
	• Medium – renewal	
	• Large renewal	Chairman
	Red Category Industry	
	• Small – new	Chairman
	• Medium –new	
	• Large -new	Board
6	Power to carry out certain works section 30 of the Water Act	Chairman & Member Secretary
7	Power to take emergency measures section 32 of the Water Act and Section 23 of the Air Act	Chairman, Member Secretary, SEE, Scientist D, Environmental Engineer & Scientist C
8	Power to give sanction to make application to the Court for restrainment of the Board section 33 of the Water Act & section 22 of the Air Act	Chairman & Member Secretary
9	Power to give direction section 33 (A) of the Water Act & Section 31 of the Air Act	SLO Chairman (under section 5 of EP Act)
10	Sanction for making complaint to the Court Section 49 of the Water Act & Section 43 of the Air Act	Chairman, Member Secretary & Senior Law Officer
	PPower to conduct inquiry on clearance of section	
11	**HAZARDOUS WASTE RULES RULE**	
	Hazardous Waste Rules Rule 6(2) Power to conduct inquiry on receipt of application.	As delegated at Sr No 5 above for the respective categories of Industries
	Power to grant, refuse, renew and cancel application Rule 6 & 7	
	Green Category Enterprises	Scientist ‘C’ or EE
	Orange Category Industry	Scientist ‘C’ or EE
	Red Category Industry	
	• Small – renewal	Member Secretary
	• Medium – renewal	

	• Large renewal	Chairman
	Red Category Industry	
	• Small – new	Chairman
	• Medium –new	
	• Large -new	Board
12	**BIO MEDICAL WASTE (MANAGEMENT AND HANDING) RUES**	
	Conduct enquiry on clearance applications (section 10 of EP Act, Rule 7(4) of BMWR)	EE
	Power to grant, refuse, renew, suspend or cancel authorization	EE
13	**SOLID WASTE MANAGEMENT RULES**	
	Conduct enquiry on clearance applications rule 16	EE
	Power to grant, refuse, renew, suspend or cancel authorization	Chairman
14	**PLASTIC WASTE RULES**	
	Conduct enquiry on clearance applications rule 13	Scientist B
	Power to grant, refuse, renew, suspend or cancel authorization	Scientist B
15	**BATTERIES (MANAGEMENT AND HANDING) RULES**	
	Accepting yearly and half yearly report from battery manufacturer, importer, Assembler, reconditioned, dealer, recycler, bulk consumer and bulk purchaser	Scientist B
	To send annual compliance status report under rule 12	Scientist C & EE
	To send compliance report under rule 12	Scientist C & EE
16	**E-WASTE MANAGEMENT RULES**	
	Conduct enquiry on clearance applications rule 13	Scientist C
	Power to grant, refuse, renew, suspend or cancel authorisation	Scientist C
17	**ISSUE OF ANALYSIS REPORTS**	
	Carrying out analysis	All Analysts accredited by the Board of National Board of Accreditation of Laboratories
	Authorised Signatory	,Scientist B and/or accredited analysts recognized under EPA 1986 and NABL and Under NABL , Scientist C Scientist B

	Purchase and issue of purchase orders of Chemicals, equipments, maintenance of equipments, annual maintenance of contract & glass ware and the certification of bills	
	• upto Rs. 1 lakhs	Scientist C /Head of scientific section with approval from AAO
	• above Rs. 1 lakh uto 2 lakhs • 2lakhs and above	AAO with approval from MS or Chairman AAO with approval from MS and Chairman
	Issue of letters, communications, inquiry with regards to the scientific section	Scientist C
	Board Water Laboratory	Scientist C incharge
	Board Air Laboratory	Scientist C
	National Water Quality Program	Scientist C
	Attending Court Matters	SLO/ALO and where required Scientist C and EE
	Verification of the analysis, compilation and analysis of report of water, air and other reports and forwarding the same to CPCB under NWMP and NAAQM	Scientist C
	Verifying the online water monitoring report and initiating necessary action	Scientist C Lab. incharge
	Verifying the online air monitoring report and initiating necessary action	Scientist C
	Verifying the water and air monitoring report submitted by the industries	Scientist C- Lab. incharge
	In charge of Conducting Stack monitoring	Scientist C
	In charge of Performance evaluation of sewage treatment plant and effluent treatment plant	Scientist C Lab. incharge
18	**Technical Section**	
	Repairs, Maintenance of vehicles, maintenance of boat, payment of petrol and diesel bills for vehicles and boat and certification of bills	EE with approval of the ACAO
	Maintenance of building	EE with approval from ACAO
	Scheduling inspections, issuing orders for inspection, raising queries regarding consent applications	JEE-
19	**Accounts Section**	
	Issue of letter for returning Bank Guarantees with approval of MS and Chairman,	SLO
	Payments of electricity/ water/ telephone bills, House tax, Building maintenance fees	Accounts Clerk on approval of ACAO/ AAO
	Maintenance of Bank Guarantee register, Return and forfeiture of Bank Guarantee	ACAO/AAO
	Issue of order for tours	ACAO on approval from MS
	Issue of tours outside country	ACAO on approval from Chairman

	Issue of cheques	ACAO/AAO
20	**Administrative Section**	
	Hiring of vehicles, Booking of tickets, Hotel Booking	OS
	Maintenance of attendance, approval of leaves of all staff except Section Heads	OS
	Procurement of stationary, purchase orders for stationary	
	• upto Rs. 50000	OS
	• above Rs 50000	OS on approval from ACAO/AAO
	Preparation of salary bills	OS/HC
	Issue of salary certificate	OS on approval from ACAO/AAO
	Issue of NOC/experience certificate for staff applying for better prospects	OS
	Scrutiny of applications for posts	OS/HC
	Housekeeping and issue of work orders	OS with approval from ACAO/AAO
	Training/Workshops	Section in charge with approval of MS/ Chairman
21	**Legal Section**	
	Issue of Show cause notice, directions under section 33A	SLO
	Issue of orders for appointment of advocates	SLO
	Certification and approval of advocate bills for appearance, Hotel accommodation, hiring of vehicles and other bills related to the court matter with approval of ACAO	SLO/ALO
	Maintenance of complaint register and redressal of complaints	SLO/ALO
	RTI applications	SLO/ALO
22	**Network Section**	
	Purchase of all hardware and software	
	• upto Rs. 1 lakh	IT Head with approval of ACAO/MS
	Issue of purchase orders	IT head with approval of ACAO/MS
	Annual maintenance	
	• upto Rs. 1 lakh • above 1 lakh	IT head with approval of ACAO/MS IT head with approval of chairman

It was informed to the members that the Board is also required to conduct a number of personal hearings of parties/members of the public/representatives of units/complainants etc. in terms of the principles of Natural Justice, in order to effectively decide the various issues pending for decision with the Board including decisions on public complaints and Consent Applications.

The members decided that the Power to conduct these hearings and to decide the concerned/ related issues accordingly may be delegated to the officials that have been delegated power to grant Consent under the Water and Air Act for various category of Industry and in case of directive of courts/ Judicial Forum the Chairman will hear the parties

Agenda item no.13

Proposal for recruitment of post of Junior Environmental Engineer and Junior Law Officer.

It was informed to the Members that the post of Jr. Environmental Engineer and Junior Law Officer fall under 'B' category employees and therefore screening of applications has to be done through written screening test. The Board has requested the Goa Public Service Commission (GPSC) to carry out the written screening test so that suitable candidates may be selected. The required fees for carrying out the written screening test and subsequent selection will be paid by the Board to the Goa Public Service Commission.

The Chairman informed the members that the Department Selection Committee is already notified in the Recruitment Rules and the same may have to be amended before GPSC does the final selection. Alternatively after screening candidates by written test, the shortlisted candidates could be examined for oral interview by the notified DSC in recruitment rules. The members approved the same.

III. The meeting ended with thanks to the chair.

122nd Meeting of The Board
In the 122nd Meeting the Board took the following decisions:

Agenda Item no. 01
Confirmation of the minutes of the 121st (Special) meeting of the Goa State Pollution Control Board held on 29/06/2016.

The members perused and confirmed the minutes of the 121st meeting of the Goa State Pollution Control Board held on 29/06/2016, so as to enter the same in the minutes book.

Agenda item no. 02
(a) Follow up action on the decision taken at the 120th meeting of the Board held on 28th April, 2016

Agenda item no. 17 and 18 -
(a) Member Secretary informed the members that in the matter placed at National Green Tribunal, Pune between Maharashtra Pollution Control Board, wherein MPCB was directed by the NGT to prepare a uniformity in the action of non conformity depending on the nature and quantum of pollution. While framing the said guidelines, Central Pollution Control Board was consulted by the MPCB, wherein a Committee of Experts was formed to prepare a Policy, Accordingly the said draft Policy was prepared and placed before the Board for adoption.

Member Secretary further informed that a Sub-Committee was formed by the Board to study the proposal. Further the draft policy was circulated to the members of the Sub-Committee. However no objections /suggestions were received from the members.

It was further informed that the fee structure for issue of Consents have not been revised by the Board since 1998 and the Board continues to charge the industrial units a meagee sum for issue of Consents. The members perused the draft fee structure as prepared by the Board and after deliberations it was decided that the Board re-frame the draft fee structure in blocks of 5 lakhs as

the present proposal is very meager considering the costs involved in scrutiny of applications / site inspections / analysis etc.

After deliberations it was decided to forward the Enforcement Policy and the Fee structure with modifications to the Department of Environment for issue of a suitable notification.

(b) Follow up action on the decision taken at the 121st (Special meeting) of the Board held on 29/06/2016

Agenda item no. 3 – The members noted that Consent to Operate under Water Act and Air Act has been granted to M/s Mohit Ispat Ltd for shifting of their existing plant from Kundaim Industrial Estate to Bicholim Industrial Estate, Bicholim.

Agenda item no. 4 – The members noted that Consent to Establish under Air act and Water Act has been granted to Greenfield Airport at Mopa, Pernem Goa.

Agenda item no. 5 – The members noted that Consent to Operate (expansion) under the Air Act and Water Act has been granted to M/s Unichem Laboratories Ltd., Pilerne Industrial Estate, Pilerne.

Agenda item no. 07- The members were informed that application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Rukminirama Steel Rollings Pvt. Limited., Plot No. L-26, Cuncolim Industrial Estate, Cuncolim, Salcete – Goa. was placed before 121st Board meeting and that the members had queried regarding the water consumption and waste water generation. In response, the unit has now clarified vide letter dated 5th August 2016, stating that the source of water is IDC supply, borewell and tankers and the domestic waste water is treated in septic tank followed by soak pit. It is further by the unit that the septic tank is regularly cleaned and disposed through night soil tankers.

After deliberations, members approved for grant of Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Rukminirama Steel Rollings Pvt. Limited., Plot No. L-26, Cuncolim Industrial Estate, Cuncolim, Salcete – Goa.

Agenda item no. 08 – The members noted that Consent to Establish has been issued by M/s Vani Agro Farms Ltd., Sanguem.

Agenda item no. 11 – Discrepancy in Seniority list of the Scientific Assistants - Member Secretary informed the members that even after sending reminders to the Departmental Selection Committee for the post of Scientific Assistants recruited in 2007, no reply has been received to authenticate the DSC minutes. Member Secretary further informed that it is now proposed to re-constitute the records of the minutes of the Departmental Selection Committee based on the available records i.e (photocopy) for the post of Scientific Assistant (Chemistry) recruited in the year 2007 and accordingly amend the Seniority list based on the merit list of the Departmental Selection Committee.

Agenda item no. 12 – The members noted that the office order and amendments issued thereafter have been forwarded to the Department of Environment, for issue of suitable notification.

Agenda item no. 13 – The members noted that developments made in the recruitment process for the post of Junior Environmental Engineers and Junior Law Officer through Goa Public Service Commission

Agenda item no. 03

Adoption of the Audit Report of the Board for the financial year 2014-2015

Member Secretary informed the members that the Auditors report of the Board for the year

2014-2015, audited M/s Rege, Kunkolienkar & Angle, Chartered Accountants could not be submitted during the meeting due to the non receipt of the report by the Board.

Chairman proposed that the Auditors report on receipt by the Board be circulated to the members for perusal and approval.

Agenda item no. 04

Approval of the Revised Budget Estimates of the Goa State Pollution Control Board for the financial year 2016-2017 and Budget Estimate of the Board for the financial year 2017-2018.

Member Secretary informed the members that preparation of the Budget Estimate of the Board for the financial year 2017-2018 could not be completed by the Board. Chairman deferred this item for the next Board meeting.

Agenda item no. 05

Applications received from the mining units for obtaining Consent to Operate (New) under the Water Act and the Air Act

Member Secretary informed that the members that this that the Supreme Court of India had lifted the ban on mining on 21st April, 2014 and fixed the annual capping of extraction of ore at 20 million metric tons / annum. Further, the Government of Goa, Department of Mines and Geology renewed 89 mining leases in the State of Goa and permitted these leases to extract ore to an extent of 20 million metric tons per annum, subject to them obtaining all other permissions.

The Board at its 118th meeting held on 10th July, 2015 vide agenda items no. 3, 9 and Table item no. 01 had granted Consents to 56 applications from the mining units for Consent to Operate under the Air and Water Acts, out of 89 renewed leases by the Govt. of Goa. 21 of the 89 renewed leases did not have valid Environmental Clearances and 12 mines who did not have relevant approvals did not apply for Consent to Operate.

Member Secretary further informed that the Board is now in receipt of applications from 4 mining companies namely: (1) M/s Salgaonkar Mining Industries, Tolem de Quela – Keli iron ore mine, T.C no. 2/77, (2) M/s Salitho Ores Pvt. Ltd, Purmar e Parvedat – Pale iron ore mines, T.C no. 84/52, (3) M/s Sova – Odamola iron ore mine, T.C. no. 45/54 and M/s Marzook & Cadar Pvt. Ltd. – Devachi Raim iron ore mine, T.C. no. 04/55 for Consent to Operate (new) under the Water Act and the Air Act. He further informed these four mining units have submitted all the relevant details / approvals along with their applications.

Member Secretary informed the members that the applications were placed before the TAC of the Board along with the inspection report conducted by the Board officials and that TAC has submitted a detailed report.

Members after perusal of the report of the TAC and deliberations decided to grant Consent to Operate to the four mining units incorporating/ fulfilling the following recommendations of the TAC by the mining units and the Board.

Since the mining leases are in cluster, their buffer zones are overlapping. The lease holders are required to carry out ambient air monitoring at a common location in the buffer zone wherever practicable in consultation with the Board.

Ambient air monitoring is required to be carried out at the nearest habitat and public places and also any habitation within the lease.

Water quality moniroitng of perennial streams, rivers and springs to be carried out at three

locations i.e upstream, downstream and at the point of the overflow/ release from the settling ponds / water pumped from mining pit.

The Board to carry out water quality monitoring at locations identified during inspection in the month of July, August and September.

Mines having part forest area and part non forest area and not obtaining Forest Clearance, Consent to Operate to be limited to non forest area.

Transportation of ore to be carried out in compliance to the order passed by the Hon. High Court of Bombay at Goa.

The Board to carry out ground water level monitoring.

Agenda item no. 06

Application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Putzmeister Concrete Machines Pvt. Ltd., Plot No: N - 4, Phase IV, Verna Industrial Estate, Verna, Salcete – Goa.

Member Secretary informed the members that the Board is in receipt of an application for Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Putzmeister Concrete Machines Pvt. Ltd., Plot No: N - 4, Phase IV, Verna Industrial Estate, Verna, Salcete – Goa for increase in production of concrete pumps, batching plants & mortar machines from 41 nos./month to 83 nos./ month. He further informed the members that the State Investment Promotion Board on Industries has approved this proposal in its 5th meeting held on 13/04/2015.

After deliberations, the members approved for grant of Consent to Operate (Expansion) under the Air Act and the Water Act of M/s. Putzmeister Concrete Machines Pvt. Ltd., Plot No: N - 4, Phase IV, Verna Industrial Estate, Verna, Salcete – Goa.

Agenda item no. 07

Operation of Micro/ Small units in residential areas/ settlement areas/ shops on ground floor of residential building (close proximity) as listed in Appendix V of the Regional Plan 2021.

Member Secretary informed the members that the Board receives numerous complaints from the residents that shops/ units are being operated in residential areas (on the ground floors) causing inconvenience to the residents. He further informed the Board that these units were earlier directed to shift to industrial estates within a period of one year. However, due to non availability of plots/ sheds in industrial areas, the Technical Advisory Committee of the Board had framed guidelines for such units which are presently issued Consents.

Member Secretary further informed that as per the Regional Plan, 2021, special provisions have been made for creation of Micro Industrial Estate at various locations in each Taluka, including Policy for plot allotment to provide self employment and encourage local entrepreneurship with a preference to the existing units and Citizens of concerned Village Panchayat. However the same has not been implemented by the State Government.

After deliberations, it was decided that harmonious consideration be taken of the issue and environmental aspects to be accorded priority and that TAC of the Board shall scrutinize the applications for Consents on case to case basis, in consultation with the Town and County Planning Dept. it was also decided to send a notice to all the Village Panchayats and Municipal Council / Corporations not to grant any permission for establishing a unit in residential areas.

Agenda item no. 08

Modifications in the Recruitment Rules for the post of Accounts Clerk, Lower Division Clerk, Assistant Environmental Engineers (Mechanical) and (Civil), Junior Environmental Engineers (Mechanical) and (Civil), Laboratory Attendants, Drivers and Peons**.**

Member Secretary informed the members that the Recruitment Rules are required to be amended inorder to provide promotional avenues to the staff. Further one post of Assistant Environmental Engineer (Mechanical) is also required to be created.

After deliberations is was proposed to amend the existing recruitment rules, for the below mentioned posts as notified under notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011, and forward a proposal to the Department of Environment for issue of suitable Notification, amending the recruitment rules for the below mentioned post and creation of one post of Assistant Environmental Engineer (Mechanical) in the Board office.

		Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposed amendment
1.	Name and designation of the post	Accounts Clerk	Accounts Clerk
	Pay scale	Rs. 5200-20200 + 2400	Rs. 5200 -20200 + 2400
	Method of recruitment	Direct recruitment failing which by transfer on deputation	40% by promotion failing which by direct recruitment and 60% by direct recruitment.
	In case of recruitment by promotion / deputation/ absorption, transfer, grade from which promotion / deputation / absorption transfer is to be made	Transfer on deputation suitable official from Government departments / organizations/ intuitions, on regular basis and having atleast two years regular service in the grade (period of deputation shall not ordinarily exceed three years)	Promotion of LDC / Data Entry Operator/ Record Keepers of the Board with five years of service in the grade, having the qualifications of Bachelor's Degree in Commerce through a recognized University / Institution

	Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposed amendment

2.	Name and designation of the post	Lower Division Clerk	Lower Division Clerk
	Pay scale	Rs. 5200-20200 + 1900	Rs. 5200 -20200 + 1900
	Method of recruitment	25% by promotion failing which by direct recruitment and 75% by direct recruitment failing which by transfer on deputation	40% by promotion failing which by direct recruitment and 60% by direct recruitment failing which by transfer on deputation
	In case of recruitment by promotion / deputation/ absorption, transfer, grade from which promotion / deputation / absorption transfer is to be made	Promotion: Promotion of Group 'D' employees of the Board with 5 years experience and passing minimum SSCE from a recognized Board / Institution	Promotion: Promotion of Group 'C' (Multi-tasking staff) employees of the Board with 5 years experience (b) possessing certificate course in typewriting and knowledge of computers. **OR** the employee should submit a certificate of typewriting within six months of promotion.

		Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposed amendment

3.	Name and designation of the post	Assistant Environmental Engineer	Assistant Environmental Engineer (Civil)	Assistant Environmental Engineer (Mechanical)
	No. of posts	03	**03**	**01**
	Pay scale	Rs. 15600 – 39100 + 5400	Rs. 15600 – 39100 + 5400	Rs. 15600 – 39100 + 5400
	Essential:	Essential: 1. Degree in Civil Engineering or equivalent from a recognized University / Institution and experience in pollution control or related aspects 2. atleast 7 years experience in pollution control or related subject 3. Knowledge of Konkani Desirable: Knowledge of Marathi	Essential: 1. Degree in Civil Engineering or equivalent from a recognized University /Institution and experience in pollution control or related aspects 2. atleast 7 years experience in pollution control or related subject 3. Knowledge of Konkani Desirable: Knowledge of Marathi	Essential: 1. Degree in Mechanical Engineering or equivalent from a recognized University /Institution and experience in pollution control or related aspects 2. atleast 7 years experience in pollution control or related subject 3. Knowledge of Konkani Desirable: Knowledge of Marathi
	Method of recruitment	$33^{1/3\%}$ by absorption / direct recruitment and $66^{2/3\%}$ by promotion/ transfer on deputation failing which by direct recruitment	75% promotion failing which by direct recruitment and 25% by direct recruitment.	By promotion failing which by direct recruitment

4.	In case of recruitment by promotion/deputation/absorption, transfer, grades from which promotion/ deputation/absorption transfer is to be made	(i)(a) By absorption of officials who are on deputation / transfer on deputation and holding analogous position at the Board for atleast 5 years continuous in the grade/direct recruitment (b) By promotion of Junior Environmental Engineer of the Board having a minimum of 7 years service in the grade or Engineering Assistant of the Board with 12 years service in the grade. © By transfer on deputation (including short term contract of officials of the State Government / State Statutory Bodies / Public sector undertakings holding analogous position in the grade and holding a Degree in Civil Engineering or equivalent from a recognizes University and experience in pollution Control or related subjects for at least 5 years (ii) Essential: Knowledge of Konkani (iii) Desirable: Knowledge of Marathi	i) (a) By promotion of Junior Environmental Engineer (Civil) of the Board having a minimum of 7 years service in the grade or Engineering Assistant (Civil) of the Board with 10 years service in the grade. (ii) Essential: Knowledge of Konkani (iii) Desirable: Knowledge of Marathi	i) (a) By promotion of Junior Environmental Engineer (Mechanical /Prod.) of the Board having a minimum of 7 years service in the grade or Engineering Assistant (Mechanical) of the Board with 10 years service in the grade. (ii) Essential: Knowledge of Konkani (iii) Desirable: Knowledge of Marathi

		Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposal for amendment

5.	Name & designation of the post	Junior Environmental Engineer (Civil)	Junior Environmental Engineer (Civil)
	Pay scale:	Rs. 9300-34800 + 4200	Rs. 9300-34800 + 4200
	Method of recruitment	25% by absorption, 75% by direct recruitment/transfer on deputation	By direct recruitment
	In case of recruitment by promotion/ deputation/ absorption, transfer, grades from which promotion / deputation / absorption transfer is to be made	(i) (a) Transfer on deputation (including short term contract) of officials of the State Government, State Autonomous bodies/ Public sector undertakings holding analogous position and possessing a Degree / Diplomas in Civil Engineering (b) by absorption of officials who are on deputation / transfer on deputation and holding analogous position at the Board for atleast 4 years continuous in the grade possessing Degree in Civil Engineering (ii) Essential: Knowledge of Konkani (iii) Desirable: Knowledge of Marathi	N.A

6.	Name & designation of the post	Junior Environmental Engineer (Mechanical)	Junior Environmental Engineer (Mechanical)
	Pay scale:	Rs. 9300-34800 + 4200	Rs. 9300-34800 + 4200
	Method of recruitment	By direct recruitment	By direct recruitment
	In case of recruitment by promotion/ deputation/ absorption, transfer, grades from which promotion / deputation / absorption transfer is to be made	N.A	N.A

	Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposed amendment

7.	Name and designation of the post	Peon	Multi-Tasking Staff
	Classification	Group 'D'	Group 'C'
	Pay scale	Rs. 4440-7440+ 1300	Rs. 5200-20200 + grade pay Rs. 1800/-
	Educational and other qualifications required for direct recruits	Essential (a) Middle School or equivalent (b) Knowledge of Konkani Desirable: (a) Knowledge of Marathi	Essential: (a) Passed Secondary School Certificate / Examination from a recognized Board /Institution **OR** Passed course conducted by Industrial Training Institute or equivalent qualifications in relevant trade from a recognized institution. Note: Course conducted by Industrial Training Institute or equivalent qualification in relevant trade, may be considered in case posts relates to technical work (b) knowledge of Konkani Desirable: (a) Knowledge of Marathi (b) Multi-tasking skills such as knowledge of operating office machines including computers
	Composition of D.P.C	Group 'D' DPC	Group 'C' DPC
	Method of recruitment	By direct recruitment	By direct recruitment Note: The department shall identify the work/duties to be performed by the male and female employees under the Multi-tasking system before appointing the candidates.

	Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposal for amendment

8.	Name and designation of the post	Laboratory Attendant	Laboratory Attendant
	Classification	Group 'D'	Group 'C'
	Pay scale	Rs. 4440-7440+ 1400	Rs. 5200-20200 + grade pay Rs. 1800/-
	Educational and other qualifications required for direct recruits	Essential (a) VIIIth Std. Pass (b) Knowledge of Konkani Desirable: (a) Knowledge of Marathi	Essential: (a) Passed Secondary School Certificate / Examination from a recognized Board /Institution (b) knowledge of Konkani Desirable: (a) Knowledge of Marathi (b) Basic knowledge of handling chemicals / glassware (c) Multi-tasking skills such as knowledge of operating office machines including computers
	Composition of D.P.C	Group 'D' DPC	Group 'C' DPC
	Method of recruitment	By direct recruitment	By direct recruitment

	Recruitment Rules as per notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011	Proposal for amendment

8.	Name and designation of the post	Driver	Driver
	Classification	Group 'C'	Group 'C'
	Pay scale	Rs. 5200-20200 + grade pay Rs. 1900/-	Rs. 5200-20200 + grade pay Rs. 1900/-
	Educational and other qualifications required for direct recruits	Essential (1) Middle School or equivalent qualifications (2) Driving licence for light vehicle (3)Unblemished experience of atleast 2 years in the line (4) Knowledge of Konkani Desirable (1) Knowledge of Marathi (2) Driving license for heavy vehicles	Essential: (a) Passed Secondary School Certificate / Examination from a recognized Board /Institution (b) Driving licence for light vehicle (c)Unblemished experience of atleast 2 years in the line (d) Knowledge of Konkani Desirable (1) Knowledge of Marathi (2) Driving license for heavy vehicles
	In case of recruitment by promotion/ deputation/ absorption, transfer, grades from which promotion / deputation / absorption transfer is to be made	Promotion of Group 'D' employee of the Board and possessing driving license with unblemished driving record	Promotion of Group 'C' employee of the Board (Multitasking staff) and possessing driving license with unblemished driving record

Agenda item no. 09
Creation of One post of Scientific Assistant (Chemistry)

Member Secretary informed the members that vide Notification no. 5/20/87-STE/DIR/Part IV/440 dated 14th July, 2011 – Series I no. 16 dated 14th July, 2011, 15 no. of posts were created in the Board office, in the pay scale of Rs. 9300-34800 + 4200, out of which 11 no. of posts were filled on regular basis. Out of the 11 Scientific Assistants, one Scientific Assistant was promoted on adhoc basis to the post of Scientist 'B' until further orders. 04 no. of posts were vacant and one vacant post of the official promoted on adhoc basis. The said vacant posts of Scientific Assistants were abolished as per the decision taken at the 114th meeting of the Board held on 19/08/2014. However, the official promoted on adhoc basis was reverted back to the post of Scientific Assistant in August, 2016, due to discrepancies brought to the notice of the office in the Seniority list.

The one vacant post of Scientist 'B' as per the Recruitment Rules is required to be filled by direct recruitment. Since there was no vacant post of Scientific Assistant to accommodate the Scientific Assistant who was promoted to the post of Scientist 'B' on adhoc basis and now reverted back to the post of Scientific Assistant, he is permitted to draw his pay against the vacant post of Scientist 'B' to the extent of his entitlement.

Member Secretary further informed that inorder to accommodate the official it is now required to create one post of the Scientific Assistant (Chemistry) in the pay scale of Rs. Rs. 9300-34800 + 4200/- as per the Recruitment Rules of the Board.

After deliberation, members agreed for the same so as to forward the proposal to the Department of Environment, for creation of the post.

Agenda item no. 10.

Settlement of Medical Reimbursement claims of the staff on obtaining Reasonability Certificate from the Goa Medical College Hospital, Bambolim**.**

Member Secretary informed the members that Medical reimbursement bills received from its staff for specialized treatment in other hospital recognized by the State Government are forwarded to the Goa Medical College Hospital, Bambolim for obtaining Reasonability. On obtaining Reasonability certificate, the same is forwarded to the Department of Environment, Govt. of Goa with a request to forward the claim to the Public Health Department, Government of Goa, for obtaining necessary Government approval.

As, the expenditure towards the Medical reimbursement bills are borne by the Board, from its funds, it was felt that Government approval may not be required once Reasonability certificate is issued by the Goa Medical College Hospital, Bambolim, as the Board at its 95th meeting held on 11th November, 2009 had resolved that

'Administrative matters which are governed by the Government Circulars / Notifications etc. need not be placed before the Board and the same should be decided by the Chairman.

After deliberations it was decided that once the claim for medical reimbursement is received from the staff , the same is forwarded to Goa Medical College Hospital, Bambolim, for obtaining Reasonability certificate. On receipt of the same, the Board could process the claim for payment accordingly. Further, it was decided that in case of major decisions, with regard to the Medical Reimbursement claim, the same could be placed before the Board for approval.

Agenda item no. 11.

Re-fixation of the pay scale of Group 'D' employees

Member Secretary informed the members that the Deparmtent of Personnel vide Office Memorandum no. 1/2/2012-PER dated 21/11/2016 has extended the benefits of the Sixth Central Pay Commission recommendation for granting Pay Band – I Rs. 5200-20200 with Grade pay of Rs. 1800 to Group 'D' employees. The O.M states that those 'D' employees who do not possess the revised minimum educational qualification of SSCE (Xth) pass/ITI pass shall undergo a training preferably within a period of 03 months. The Circular further states that the fixation of pay is to be done notionally as on date of appointment or as on date of completion of training, as the case may be and actual benefits to be given from 01/01/2016 or on the date of completion of training as the case may be.

The Member Secretary further informed that the staff not possessing the required qualifications have been imparted the required training. After deliberations the members agreed to adopt the Office Memorandum no. 1/2/2012-PER dated 21/11/2016 of the Department of Personnel, Govt. of Goa to the staff of the Goa State Pollution Control Board.

Agenda item no. 12

Proposal for Bio-remediation of hazardous waste accumulated by M/s. Sunrise Zinc Ltd. located at Cuncolim Industrial Estate

Member Secretary informed the members that upon closure of the industry of M/s. Sunrise Zinc Ltd., located at Cuncolim Industrial Estate, the hazardous waste accumulated by the unit is posing threat to the environment, as a result of which the Board has decided to bio-remediate the same. He further informed that the Board had approached M/s Concept Biotech, Gujarat, for an amount of Rs 6,85,000/. to carry out the said pilot study of vermin- remediation of the hazardous waste accumulated by M/s Sunrise Zinc Ltd. at Cuncolim Industrial Estate.

After deliberations Chairman suggested that the Board file a criminal offence with the National Green Tribunal, Pune with regard to the haphazard dumping of hazardous waste by M/s Sunrise Zinc Limited. He further suggested that the Board could simultaneously undertake this pilot project of vermin-remediation of hazardous waste, the cost of which is to be recovered from M/s Sunrise Zinc Limited under the policy – polluter pay principle. He further suggested that the Board should place before the National Green Tribunal that the cost incurred towards the temporary covering measures and the litigation be jointly and severally recovered from the four Respondents, which has been so far incurred by the Board and further in respect of the permanent solutions to the same.

Agenda item no. 13

Application of M/s Merck Limited, Usgaon Goa, for amendment in the Consent to Operate under the Water Act and the Air Act.

Member Secretary informed the members that M/s Merck Limited, Usgaon Goa, has sought amendment in Consent to operate issued to the unit under the Air Act and Water Act, for the replacement of part of permitted quantity of Vitamin E acetate with 2-ethylhexylcyanoacetate (EHCA). He further informed that the unit has submitted that both the products "Vitamin E acetate" & "EHCA" are of same category and the replacement of "Vitamin E acetate" with "EHCA" is to be done under "change in product-mix" and TAC of the Board has recommended for grant of Consent.

Agenda item no. 14

Sewage and Waste water system for beach shacks

Member Secretary informed the members that the Department of Tourism has allotted shacks for the year 2016-2019, along the beaches, some of which do not have proper access. These shacks provide toilet facilities and carry out washing of utensils etc. for which a pipe line is required to be laid for providing PWD water supply and collection of sewage and wash water, for which a holding tank of adequate capacity is required to be laid above the ground as per the required norms, these holding tanks of adequate capacity are required to be located a strategic points, which have proper road access from where the night soil tankers should pump the sewage from these holding tanks and dispose it for treatment to the sewage treatment plant.

After deliberations it was decided to inform the Department of Tourism to carry out the said works, inorder to prevent the shack owners from discharging their wash water and sewage water in the open. It was further decided that the loss proportionately could be recovered in terms of fees. Meantime, the Consents to be granted with a condition that adequate environmental safety measures including disposal of effluents / garbage etc. is taken care of.

Agenda Item no. 15

Imparting of Training on Environmental Audit for the Staff of the Board

Member Secretary informed the members that pursuant to the order of the Hon. High Court of Gujarat, Gujarat Pollution Control Board has notified an Environmental Audit Scheme, for which officials of the Board were provided training on Environmental Audit through the Centre for Science & Environment (CSE). He further informed that the officials are now required to be imparted training in major sectors i.e i.e. mining, general red category industries, major hotels, air polluting industries such as sponge iron units , induction furnaces, pig iron plant, rolling mills, metcoke plants etc., for which it is proposed to request CSE for formulate a scheme. Member Secretary informed the members that the Board will have to incur expenditure towards to and fro travel and hotel stay for 3 nights for CSE officials who will be imparting training

After deliberations, members agreed to request Centre for Science and Environment to impart training in major sectors, and the cost towards conducting the said training to be borne by the Board. Members further agreed to invite Member Secretary, Gujarat Pollution Control Board for a workshop on

Environmental Audit once the scheme is ready.

Agenda item no. 16
Deputing of Officials for M.Tech course through BITS Pilani, Goa Campus

Member Secretary informed the members that the Board at its 111th meeting held on 24/01/2014 had decided to impart Continuing Education Programme to the Staff of the Board in M.Tech in Environmental Engineering through BITS Pilani, Goa campus for which 26 nos. (including staff appointed on contract) of Technical and Scientific staff of the Board were deputed to undergo the said course.

He further informed that as per the decision taken at the 116th meeting of the Board held on 16th December, 2014, the Registration fee and the nomination fee would be borne by the official nominated and the Tuition fee (per semester) would be paid on 50:50 basis i.e by the Board and the official, a bond as prescribed to this effect would be signed by the employees. As regards to contract employees of the Board, the employees would be required to pay the entire fees without any contribution from the Board in addition to signing the prescribed Bond.

Member Secretary further informed that the 50% of the semester fees will have to be borne by the Board and 50% by the official undergoing the course. The total cost per staff to be incurred by the Board for the course (semester fee – per semester) works out to Rs. 20375/-.

Member Secretary also informed that the officials who are deputed to undergo M.Tech shall not be permitted to undergo any other course simultaneously during the courses of this study, as it will hamper the office work.

After deliberations it was decided to depute the following staff of the Board to undergoing the M.Tech course through BITS Pilani, Goa Campus on the same terms and conditions as earlier approved by the Board, upon signing a Bond.:

Ms. Connie Fernandes – Sc. 'C'
Mrs. Francisca Pereira – Sc. 'B'
Mrs. Joshna Mahale – S.A
Mr. Chaitanya Salgaonkar – S.A
Mr. Ravi Naik – S.A
Mrs Denza Cardozo – S.A
Mr. Krishnanath Pednekar – S.A
Mr. Sanmesh Borkar – S.L.A
Mrs. Jocelyn Coelho – J.L.A
Miss Reema Kavlekar – J.L.A
Mrs. Swara Gaonkar – J.L.A

Agenda item no. 17
Applicability of fees for Authorization issued by the Board

Member Secretary informed the members that the Board at its 114th meeting held on 19/08/2014 had made applicable fees for authorizations issued by the Board under: (a) Hazardous Waste Authorization (b) E-Waste Authorization (c) Amendments and expansion involving no additional investment (d) for registration of dealers under Batteries Waste (Management and Handling) Rules. He further stated that since the work load has increased in processing the above applications, which involves, scrutiny and inspection, and further follow up, it was proposed to amend the applicability of fees as under

a.	Hazardous Waste Authorization	Rs. 10,000/-for issue of such Authorization
b.	E-Waste Authorization	Rs. 10,000/- for issue of such Authorization
c.	Batteries Waste Authorization	Rs. 10,000/- for issue of such Authorization
d.	Plastic Waste Registration	Fresh registration with validity of one year – Rs. 3000/- and subsequent renewal registration Rs. 10,000/-.
e.	Municipal Solid Waste Authorization	Rs. 10,000/- for issue of such Authorization

It was further decided that a penalty of 50% be imposed on the Authorization / Registration fees payable, if the application is not submitted by the date as prescribed under the concerned Rules for the purpose of renewal.

Members deliberated and approved for the amendments in fees/ penalty, so as to forward the same to the Department of Environment for issue of a suitable notification.

III. With the permission of the Chair, Member Secretary informed the members that consequent to the 61st meeting of the Chairmen and Member Secretaries of the State Pollution Control Boards/ Committees held in Delhi, the following requests are required to be made to the Central Pollution Control Board and Ministry of Environment and Forests

Central Pollution Control Board –

To develop a OCCMS software through NIC to decide the categorization of the industries to adopt common online forms for Consent management. It was further decided to invite NIC to visit Goa State Pollution Control Board at the earliest with the input.

To devise standards for source monitoring for coal / coke handling in Port areas

Ministry of Environment and Forests –

Implementation of single common software for the Goa State Pollution Control Board as is being done in other State Pollution Control Boards

To amend the Water Cess Act, to permit the State Pollution Control Board to collect the Cess and remit 20% of the amount to the Ministry of Environment and Forests

Exemption of Environmental Clearance for projects of common municipal solid waste where the project is proposed on exiting dump site and the project also proposes to remediate the existing dump.

To notify standards for Reduced Derived Fuel (RDF), as that the cement companies will start paying for the RDF supplied by the municipal solid waste processing facilities.

To consider State Pollution Control Boards / Pollution Control Committees of smaller states like Goa, Pondicherry, Chandigarh, Delhi etc. on similar lines as North Eastern States for infrastructure funding, as the Cess amount generated by these Board is not more than Rs. 5 crores being small State.

Members approved the above and authorized Chairman to convey the requirements / decision taken by the Board to the Central Pollution Control Board and the Ministry of Environment and Forests, for needful at their end.

IV. The meeting ended with thanks to the Chair.

123rd Meeting of the Board
In the 123rd Meeting the Board took the following decisions:

Agenda item no. 01
Confirmation of the minutes of the 122nd meeting of the Goa State Pollution Control Board held on 28/11/2016.

The members perused and confirmed the minutes of the 122nd meeting of the Goa State Pollution Control Board held on 28/11/2016, so as to enter the same in the minutes book.

Agenda item no. 02
Application for Consent to Operate under the Water Act and the Air Act of Tembecho Dongor iron and manganese mine of Jairam Neogui.

Member Secretary informed the members that the project proponent has submitted an on-line application for issue of Consent to Operate under the Water Act and the Air Act for operating the Tembecho Dongor iron and manganese mine, T.C no. 59/1951, situated at Maina and Cavorem Villages of Quepem Taluka and Rivona Village of Sanguem Taluka, South Goa District. The project proponent has submitted the following documents:

1.	Copy of Environmental Clearance
2.	Valid mining lease
3.	Capping from Directorate of Mines and Geology
4.	Valid approved mining plan (surface plan)
5.	Transportation routes (from mine to jetty / plot)
6.	Number of trucks expected to ply for transportation and timing
7.	Location proposed for air / water quality monitoring in core zone and buffer zone on coastal map of Department of Mines and Geology
8.	Mining Plan / Cadastral plan indicating the settling pond, check dams, retaining walls / structures, garland drains (Environmental Plan)
9.	Proposed stacking area of overburden / extracted ore. Location showed on mining plan
10.	Screening plants / beneficiation plants / mobile screening plants operating in the lease. Exact location shown on mining plan
11.	Map indicating water bodies / wells / bore wells in the core and buffer zone will be provided. Monitoring levels of water table of these wells will be submitted by the mine (key plan)

Member Secretary further informed the members that the Ministry of Environment, Forest & Climate Change, Impact Assessment Division, Government of India vide their letter dated 13th February, 2017 has lifted abeyance on Environmental Clearance granted to the Mining lease 'Tembechem Dongor, bearing

T.C. no. 59 of 1951 of M/s Jairam B. Neugi and transfer of EC to M/s Minescape Minerals Pvt. Ltd. – Goa.

Further, Member Secretary informed that the project proponent had applied to the Directorate of Mines and Geology for enhancement of production limit from the previous 0.135 million tons allotted on ad-hoc pro-rata basis to 0.300 million tons. Accordingly, the Directorate of Mines of Geology, Govt. of Goa has vide their letter dated 29/12/2016 vide serial no. (1) has stated that the 'production limit for T.C no. 59/51 after enhancement now stands at 0.300 million tons for the year 2016-2017 valid till 31/03/2017. Further vide serial

(2) it is stated that the 'enhancement is granted with the objective of attaining the target of 20 MT production of iron ore capped in the State of Goa by the decision of the Hon. Supreme Court of India in its order dated 21/04/2014 in W.P. no. 435/2012.

The Chairman sought clarifications regarding the present status of Air and Water quality in the area where mining activity is proposed to be undertaken. The Member Secretary clarified that the Goa State Pollution Control Board monitors water quality at Kevona (near Revona) at bund near Kushawati river on monthly basis under the National Water – quality Monitoring Programme (NWMP) of the Central Pollution Control Board. Various physico- chemical parameters were analyzed along with the selective metal/ microbial concentration. On perusal of said database for a period from April, 2015 to March 2016, it is seen that the Water quality parameters are within the prescribed Central Pollution Control Board standards except microbial contamination. The water quality reports indicate that the average total colliform values exceed 5000 MPN per ml. as per the Central Pollution Control Board standards.

Further, the Member Secretary informed that the Ambient Air quality under the National Ambient Air Quality Monitoring Programme (NAMP) of the Central Pollution Control Board is carried out by the Goa State Pollution Control Board at 15 locations within the State of which, two locations i.e. Tilamol (Quepem) and Curchorem Town are within the peripheral zone of the said mining lease and the respective mining cluster.

The monitoring at these two locations is carried out by the Board through laboratories accredited through the Ministry of Environment Forest and Climate Change, Govt. of India and the parameters analysed includes SO_2 and NO_2 along with PM_{10} and $PM_{2.5}$. In addition, Carbon monoxide, Ozone and Lead are also Monitored twice in a week. On perusal of the said database, it is observed that at both these locations, the analysed parameters are within the prescribed National Ambient Air- quality standards as notified by the Central Pollution Control Board in 2009.

The members noted that the said mining lease has been permitted to extract 0.300 million tons of ore upto 31st March, 2017. This quantum of extraction which otherwise was expected to be carried out over a period of one year, whereas within 25 days the mining unit would be proposing to extract the whole quantity i.e. 0.300 millions tons permitted by Directorate of Mines and Geology and the Environmental Clearance issued by the Ministry of Environment Forest and Climate Change. This would lead to intensive operation and could have adverse impact on the water and air quality. The impact on the ground water if any and would also be required to be assessed.

After due deliberations and discussions it was decided to seek the following clarifications from the mining proponent:

The total quantum of ore to be proposed to be extracted upto 31st March, 2017.

The proposed quantum of ore proposed to be transported to the jetty at Curchorem from the mine upto 31st March, 2017.

The number of trucks that are expected on the road on daily basis to achieve this target.

The measures proposed to be undertaken for preventing any adverse impact on the air quality.

As the total colliform values in the Kushawati river are already exceeding the prescribed standards, the amount of labour proposed to be deployed, quantum of sewage expected to be generated, the methodology of treatment and disposal in a manner to ensure that there is no impact whatsoever on the total colliform values in the Kushawati river. An action plan for zero discharge of sewage from the mining lease.

It was decided that upon receipt of the clarifications being given by the project proponent/ applicant, the Board meeting could be re-convened and proceedings of that meetings will be read with the part minutes of this deferred meeting.

III. The meeting was adjourned/ deferred accordingly.

123rd Re –adjourned Meeting of the Board

In the 123rd Meeting the Board took the following decisions:

Further to the deliberations and discussions held during the adjourned meeting on 6th March, 2017, the project proponent submitted clarifications vide letter dated 6th March, 2017.

Member Secretary informed the members that the said clarifications were forwarded to the Directorate of Mines and Geology (DMG), Water Resource Department (WRD) and Ministry of Mines – Indian Bureau of Mines (IBM) (Office of the Regional Controller of Mines) for their opinion. DMG, WRD and IBM vide their letters dated 08/03/2017, 09/03/2017 and 09/03/2017 respectively have submitted their clarifications. He also informed that the Board has also assessed the probable impact on air quality based on the data of air monitoring available at Tilamol junction. Letters received from DMG, WRD and IBM and the assessment done by the Board were placed before the members.

The details of the existing number of trucks carrying ore from the presently operating mine and the e-auctioned ore being transported on the same route on which the ore from this mine will be transported cannot be ascertained off hand which is however regulated by the Department of Mines and Geology as informed by the Assistant Director of Mines and Geology during deliberations.

The Government of India and the State Government organizations have already granted their permissions to extract ore from this mine upto 31st March, 2017. The Department of Mines and Geology has permitted extraction of 0.3 million tons upto 31st March, 2017 and the project proponent has undertaken that though they will extract the whole quantity by 31st March, 2017, they will transport only 9% of the ore extracted upto 31st March, 2017, i.e 27,000 tons and they have undertaken that the entire transportation shall be done under prevalent laws and guidelines and under the supervision of the Directorate of Mines and Geology. The balance quantity will be transported in the fair season prior to onset of monsoon. The shortage of time to 31st March, 2017 deadline was the basis of High Court issuing the direction to the Board to convene a meeting. As verification of the plan submitted by M/s Minescape Minerals Private Limited (earlier Jairam Neogui) will take time and eat into available time for extraction, in the special circumstances and in view of the Court instructions, balance of convenience necessitates a reliance on self certification by the project proponent. Further, considering the ambient air quality monitoring and the water quality data in the area where the mining activity is proposed to be undertaken to be well within the permissible limits, as on date, it is seen that the balance of convenience is in favour of the applicant. After due consideration and discussions, the Board decided to consider this application for Consent to Operate the said mine subject to the following conditions:

1. The project proponent will submit a performance Bank Guarantee amounting to Rs. 1 crore valid for one year as per the decision of the Board by 14/03/2017. However, the project proponent requested for time to submit the Performance Bank Guarantee as the next three days being Bank holidays. Further, the Board decided that in the event the project proponent fails to submit the Bank Guarantee by 14th March, 2017, the Board shall be free to revoke the Consent issued to the project proponent.

2. Having considered the ambient air quality monitoring data which is within the permissible limits for the last six months which should be part of the minutes. The Board shall monitor the air quality in the buffer zone and having established the base-line monitoring data which is within the permissible limits and in the event the air quality deviates the permissible limits from the base- line data during the mining operation of the present mine, then any deviation / rise in the pollution shall be attributed to the

operation of the present mine, and the Board shall be free to take action which may include forfeiting the performance Bank Guarantee and revoke the Consent to Operate issued. Similarly, the project proponent shall ensure that the sewage generated within his premises shall be managed as submitted vide their letter dated 06/03/2017, i.e to transport the sewage to the Public Works Department Sewage Treatment Plant at Margao.

3. The project proponent shall transport only 27,000 tons of the ore extracted upto 31st March, 2017.

4. The Board officials will inspect the mine during the weekend to assess the base-line data and maintain appropriate records duly signed by the Board officials and the project proponent with photographs.

5. To co-relate the data, the Department of Mines and Geology will share the data with regard to the transportation of ore with the Goa State Pollution Control Board, so that the data could be co-related with the air quality monitoring at this location as well as all the mines where the operations are in progress.

6. The Board officials will also conduct weekly inspections and submit reports.

7. The Board authorized the Member Secretary of the Board to issue Consent to the mining unit of M/s Minescape Minerals Private Limited (earlier Jairam Neogui) today (i.e 10/03/2017) with a validity period of upto 31st March, 2017, as the project proponent has submitted an Undertaking to submit the performance Bank Guarantee by 14/03/2017, failing which the Board will be at liberty to withdraw the Consent.

II. The meeting ended with thanks to the Chair.

CHAPTER 4

COMMITTEES AND SUB-COMMITTEES CONSTITUTED BY THE BOARD AND THEIR ACTIVITIES

4.1 TECHNICAL ADVISORY COMMITTEE

In order to develop uniformity in approach and to ensure timely clearance of the consent applications, Shri. Jose Manuel Noronha, Chairman of the Board constituted a Technical Committee comprising technically and scientifically qualified professionals which was re-constituted during the year under report vide Order no. 8/11/09-PCB/ Vol.VIII/7150 dated 10/02/2014. The Committee comprises of the following members:-

The Committee comprises of the following members:-

1. Dr. Xivanand Verlekar, Retd. Scientist – (Biologist) N.I.O, 606, Pinto Vaddo, Candolim, Bardez Goa.
2. Dr. Fraddry D'Souza, Fellow, The Energy and Resource Institute (TERI), Western Rgional Centre, House no. 233/GH-2, Vasudha Housing Colony, Alto Santa Cruz, Bambolim Goa 493202.
3. Prof. Neeraj Bale, Prof (Mechanical Engg.), Agnel Institute of Technology & Design, Assagao, Bardez Goa.
4. Mrs. Jenica Sequeira, Scientist 'C', Goa State Pollution Control Board, Panaji.
5. Mrs. Nandan Prabhudessai, Junior Environmental Engineer, Goa State Pollution Control Board.
6. Mr. Sanjeev Joglekar, Environmental Engineer, Goa State Pollution Control Board.

The Committee held weekly meetings on every Monday at 4.00 pm in the Conference hall of the Board to scrutinize and make recommendations / comments / suggestions on the applications from industrial units received by the Board for Consent to Establish / Operate / Renewal of Consents under the Water and Air Acts, Authorizations under the Hazardous Waste Rules, Bio-medical Waste Rules, etc. (except those of Green category industries). The applications from green category industries were scrutinized by the technical and scientific sections of the Board and approved by the Chairman on recommendation by the Member Secretary for grant of Consents.

The recommendations of the Technical Advisory Committee meetings, in the form of Minutes, were placed before the Chairman for approval and on approval by Chairman; Consent Orders were issued by the Member Secretary.

4.2 PURCHASE COMMITTEE

Shri. Jose Manuel Noronha, Chairman reconstituted the Purchase Committee under the Scientific Section and Administrative Section vide Orders no.1/5/12-PCB/Vol.XV/673 dated 16/01/2013 and no.1/5/12-PCB/Vol.XV/6732 dated 18/01/2013 respectively. The Committee for Scientific Section comprises the following members:-

1. Mrs. Jenica Sequeira, Scientist 'C', Goa State Pollution Control Board.
2. Accounts cun Administrative Officer, Goa State Pollution Control Board
3. Mrs. Lizette D'Souza, Scientist 'F', National Institute of Oceanography.
4. Environmental Engineer, Goa State Pollution Control Board
5. Mrs. Francisca Pereira, Scientist 'B' Goa State Pollution Control Board
6. Mrs. Natalia Dias, Senior Law Officer, Goa State Pollution Control Board
7. Mr. Rajiv Nevgi, Industrialist, Shriram Sadan, Dattawadi, Mapusa, Goa

The Committee for the Administrative Section comprises the following members:-

1. Environmental Engineer, Goa State Pollution Control Board.
2. Accounts cum Administrative Officer, Goa State Pollution Control Board
3. Senior Law Officer, Goa State Pollution Control Board.
4. Office Superintendent, Goa State Pollution Control Board.

4.3 COMPLAINTS COMMITTEE

The present Board Constituted a Complaint Committee to scrutinize and take appropriate action on the complaints received by the Board. The Committee was constituted vide Order no.1/5/15-PCB/Vol. VXII/Amdn/9242 dated 19/08/2016 and comprises the following members:

1. Senior Law Officer/Assistant Law Officer ……Complaint Committee Incharge
2. Environmental Engineer ……Member
3. Scientist 'C' (Miss. Connie Fernandes) ……Member
4. Software Engineer/ Network Engineer (Mr. Pratik Chari) ……Member

The Committee meets every Monday to screen and shortlist the complaints requiring action by the Board. These complaints are monitored by inspections and action deemed fit is initiated if required. Other cases not within the purview of the Board were forwarded to the respective departments for further needful action.

4.4 CONSTITUTION OF A WASTE DISPOSAL COMMITTEE AT THE GOA STATE POLLUTION CONTROL BOARD

The committee constituted vide Order no.3/20/07-PCB/Vol.VII/Part/7286 dated 24/11/2015 under the Chairmanship of Mr. Jose Manuel Noronha was in force during the year under report. The committee comprises of following members.

a.	Mr. Levinson J. Martins	Chairman
b.	Mr. Sanjeev Joglekar	Member
c.	Mrs. Jenica Sequeira	Member
d.	Mrs. Natalia S. Dias	Member
e.	Mr. Devendra Arlekar	Member
f.	Mrs. Tulita da Costa e Fernandes	Member

CHAPTER 5

MONITORING NETWORK FOR AIR AND WATER QUALITY

The Goa State Pollution Control Board monitors the air and water quality under the Central Pollution Control Board sponsored projects National Air Monitoring Programme (NAMP) and National Water Monitoring Programme (NWMP). The NAMP and NWMP projects covers 18 air quality monitoring locations and 52 water quality monitoring locations respectively within the State of Goa. The details of the projects are given as under.

5.1 National Air Monitoring Programme (NAMP)

This is an ongoing activity funded by the Central Pollution Control Board, New Delhi under the National Air Monitoring Programme (NAMP). Under this programme the Board continued to monitor the ambient air quality at 18 locations within the state of Goa. The following are the 18 stations under the NAMP project.

1. Panaji Town, Near GSPCB Office
2. Vasco Town, Near Electricity Department
3. Near Fire Brigade Station, MPT
4. Assanora
5. Bicholim
6. Honda
7. Codli
8. Amona
9. Usgao
10. Curchorem
11. Sanguem
12. Tilamol-Quepem
13. Margao Town
14. Mapusa Town
15. Ponda Town
16. Kundaim Industrial Estate
17. Cuncolim Industrial Estate
18. Tuem Industrial Estate

The geographical location of the 18 air quality monitoring stations is shown in the map presented in Figure 5.1. Out of the 18 stations, the Board operates 4 stations on its own, i.e., at Vasco, MPT- Mormugao and Panaji and Mapusa and the remaining 14 locations are outsourced to MoEFCC approved laboratories. The ambient air quality data for these stations observed during the year are given in Annexure V. The parameters monitored at these locations include NO_x, SO_2, PM_{10} and $PM_{2.5}$ are monitored on regular basis.

Figure 5.1: Map of Goa showing the Ambient Air Quality Monitoring Stations under the National Air Monitoring Programme (NAMP)

5.2 Trend Status of Ambient Air Quality in Goa

5.2.1 Ambient Air Quality in the Mining Areas of Goa

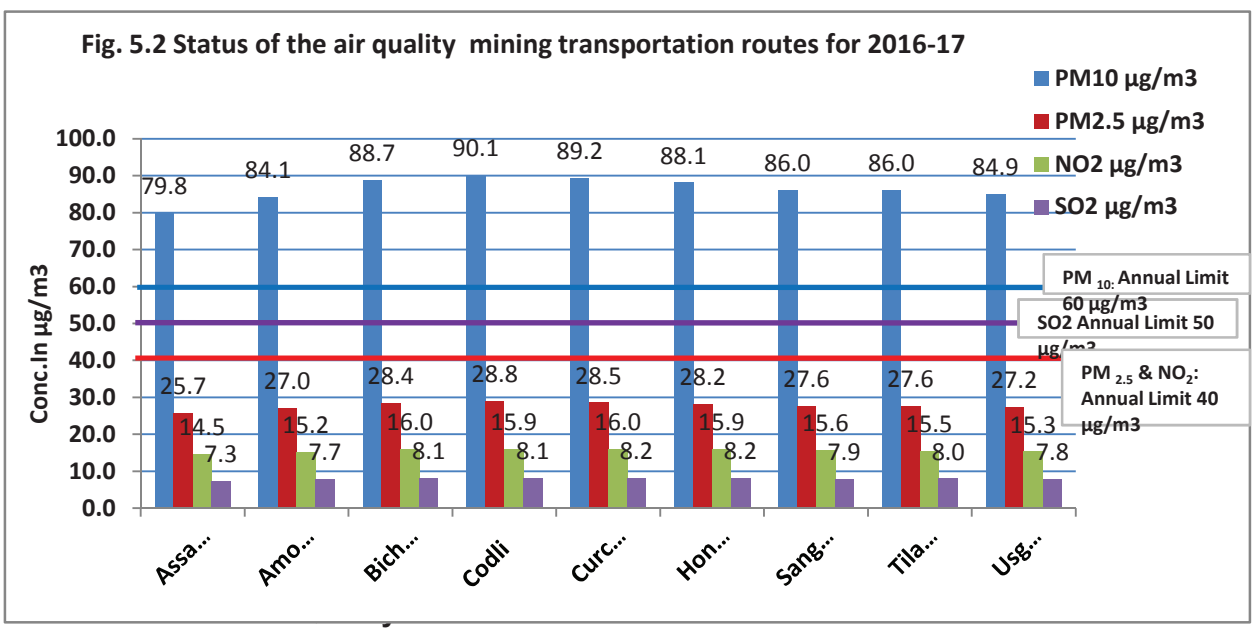
Under the National Air Monitoring programme (NAMP), the Board through the CPCB sponsored project conducts ambient air quality in areas affected due to mining transportation activities. The areas

under the NAMP project in mining areas include Assanora, Bicholim, Honda, Codli, Amona, Usgao, Curchorem, Quepem and Sanguem.

During the year under report there were no mining and related transportation activities in the State of Goa as a result of the Supreme Court directions. However, being a continuous study, the air monitoring programme was conducted in the above areas during the year. The data and graphical representation is placed in Table 5.1 and Fig.5.2. The data indicates that the levels of SO2, NO2 andPM2.5 levels are within the permissible limits; where as, PM10 is exceeding the permissible limits at Amona, Assanora, Bicholim, Codli, Curchorem, Honda, Sanguem, Tilamol Quepem, Usgaon

Table 5.1 :Trend status of Air Quality in areas which were affected with mining transportation during April 2016 – March 2017

Sr.No	Parameter Location	PM10 µg/ m^3	PM2.5 µg/ m^3	NO_2 µg/ m^3	SO_2 µg/ m^3
1	Assanora	79.8	25.7	14.5	7.3
2	Amona	84.1	27.0	15.2	7.7
3	Bicholim	88.7	28.4	16.0	8.1
4	Codli	90.1	28.8	15.9	8.1
5	Curchorem	89.2	28.5	16.0	8.2
6	Honda	88.1	28.2	15.9	8.2
7	Sanguem	86.0	27.6	15.6	7.9
8	Tilamol Quepem	86.0	27.6	15.5	8.0
9	Usgaon	84.9	27.2	15.3	7.8
Sch VII EPR 1986, Annual Limits		60	40	40	50

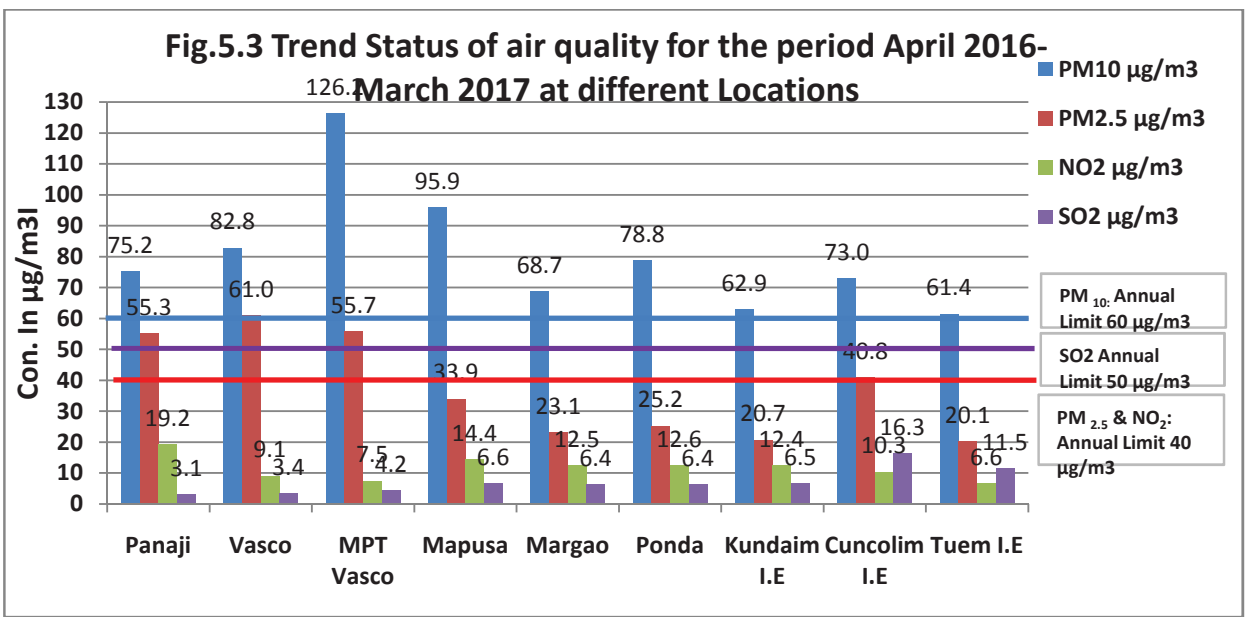


The Board is conducting ambient air quality monitoring at the following locations; viz; Panaji, Vasco, MPT area in Vasco, Mapusa, Margao, Ponda and Kundaim Industrial Estate. The Panaji and Vasco stations are being monitored by the Board, where as, monitoring at Mapusa, Margao, Ponda and

Kundaim Industrial Estate are monitored through MoEF approved laboratories. The annual averages of PM10, PM2.5, SO2 and NO2 at some of the Towns is shown below in Table 5.2 and Fig 5.3. The data indicates that the levels of SO2, NO2 and PM2.5 levels are within the permissible limits; where as, PM10 is exceeding the permissible limit at Panaji, Vasco, Mapuca, Margao , Ponda & Kundaim Industrial Estate.

Table-5.2: Trend status of Air Quality for the period April 2016 – March 2017 at different locations in Goa

Sr.No	Parameter Location	PM10 µg/m3	PM2.5 µg/m3	NOX µg/m3	SO2 µg/m3
1	Panaji	75.2	36.8	19.2	3.1
2	Vasco	82.8	30.5	9.1	3.4
3	MPT Vasco	126.2	55.7	7.5	4.2
4	Mapusa	95.9	6.2	14.4	6.6
5	Margao	68.7	23.1	12.5	6.4
6	Ponda	78.8	25.2	12.6	6.4
7	Kundaim I.E	62.9	20.7	12.4	6.5
8	Cuncolim I.E	73.0	40.8	10.3	16.3
9	Tuem I.E	61.4	20.1	6.6	11.5
Sch VII EPR 1986, Annual Limits		60	40	40	50



5.3 National Water Quality Monitoring Programme (NWMP)

The Goa State Pollution Control Board monitors water quality at 52 locations throughout Goa under the Central Pollution Control Board sponsored project NWMP. The water bodies monitored include rivers, wells, canals, lake, reservoir and creek. Among the rivers, the estuarine rivers as well the sweet

water rivers which form a part of the network for water intake points for water treatment plants for public water supply have been covered. Ground water sources (well water) located within the industrial estates are also part of this programme.

The 52 locations covered under this programme are distributed throughout Goa such that 29 stations are located in the North District and 23 are located in the South District.

NORTH GOA				
Sr. No.	Type	Rivers/ Lake/ Canal/Wells	Classification as per designated best use criteria	Location
1	R	Rv. Tiracol	Not classified	Tiracol
2	R	Rv. Chapora	Class 'C'	1.Near Alorna Fort, Pernem
3	R		Not classified	2.Siolim
4	R	Rv. Kalna	Class 'C'	Chandel, Pernem
5	R	Rv. Madei	Class 'C'	Dabos, Valpoi
6	R	Rv. Valvanti	Class 'C'	Sankli, Bicholim
7	R	Rv. Bicholim	Class 'C'	Baranzan Nagar, Bicholim
8	R	Rv. Assanora	Class 'C'	Assanora
9	R	Rv. Sinquerim	Not classified	1.Candolim Side Near Bridge
10	R		Not classified	2.Nerul Temple
11	R	Rv. Khandepar	Class 'C'	Opa – Ponda
12	R	Rv. Mandovi	Saline Water II	1.Tonca, Marcela
13	R		Not classified	2.Amona Bridge
14	R		Saline Water II	3.Mandovi Bridge
15	R		Not classified	4.IFFI Jetty
16			Not classified	5. Ribander - Chodna Ferry Point
17	R		Not classified	6.Near Hotel Marriot
18	R	Rv. Mapusa	Saline Water II	Culvert on Mapusa-Panaji Highway
19	L	Anjunem Lake	Not classified	Anjunem
20	L	Mayem Lake	Class 'C'	Mayem, Bicholim
21	L	Carambolim Lake	Not classified	Carambolim, Old Goa
22	C	Cumbarjua Canal	Saline Water II	Corlim (Discharge Point of Syngeta Ltd.)
23	W	Well - Kudaim I.E.	Class 'A'	M/s Cadila Healthcare Ltd.
24	W	Well - Corlim I.E.	Class 'A'	Corlim Industrial Estate
25	W	Well - Pilerne I.E.	Class 'A'	M/s Unichem
26	W	Borewell - Bethora I.E.	Class 'A'	Bethora Industrial Estate
27	W	Borewell - Madkaim I.E.	Class 'A'	Madkaim Industrial Estate
28	STP	Influent Sample	Not classified	Tonca STP
29	STP	Treated Effluent Sample	Not classified	Tonca STP

SOUTH GOA				
Sr. No.	Type	Rivers/ Lake/ Canal/Wells	Classification as per designated best use criteria	Location
1	R	Rv. Zuari	Saline Water II	1.Panchawadi
2	R		Not classified	2.Borim Bridge
3	R		Not classified	3.Marciam Jetty
4	R		Saline Water II	4.D/S of point where Kumbarjua Canal Joins
5	L	Rv. Sal	Not classified	1.Rumder
6	R		Not classified	2.Khareband, Margao
7	R		Saline Water II	3.Pazarconi, Cuncolim (Near Culvert Margao- Cancona NH)
8	R		Not classified	4.Orlim Bridge, Orlim
9	R		Saline Water II	5.Near Hotel Leela, Mobor, Cavelossim
10	R	Rv. Talpona	Class 'C'	1.Canacona
11	R	Rv. Khandepar	Class 'C'	Codli near Bridge, u/s OPA waterworks, Sanguem
12	R	Rv. Kushawati	Class 'C'	Near Bund at Kevona, Rivona, Sanguem
13	L	Salaulim Lake	Class 'C'	Salaulim, Sanguem
14	L	Raia Lake	Not classified	Curtorim
15	L	Saipem Lake	Not classified	Saipem
16	L	Curtorim Lake	Not classified	Curtorim
17	C	Agricultural Canal	Class 'E'	Agricultural Canal upstream of Cuncolim I.E. (1 Km from M/s Nicomet Ind.)
18	C	Agricultural Canal	Class 'E'	Agricultural Canal downstream of Cuncolim I.E. (1 Km from M/s Nicomet Ind.)
19	C	Dando Creek	Class 'C'	Dando Mollo, Velsao, Marmugao
20	W	Well - Verna I.E.	Class 'A'	M/s Cipla Limited
21	W	Well - Sancoale I.E.	Class 'A'	Sancoale Industrial Estate
22	W	Well - Zuari I.E.	Class 'A'	Zuari Industrial Estate, ZuariNagar
23	W	Borewell - Concolim I.E.	Class 'A'	Cuncolim Industrial Estate

The total 52 locations are divided into two groups i.e., (i) 43 locations which are being monitored monthly and (ii) 9 locations (i.e. Bore wells) are monitored half yearly.

Five Hundred and Sixty Five samples were collected from all these water bodies and analyzed during the year (Four Hundred and Eighty Nine samples for 27 parameters and Twenty Four samples for 4 parameters during the regular monitoring and Seventy Six samples for micro pollutants during annual monitoring).

The data of the water samples analyzed during 2016-2017 was interpreted using the Central Pollution Control Board standards prescribed for river classification based on the designated best use of the water body.

From the water quality data analysis it is found that the fecal coliform of River Mapusa, River Mandovi, River Sal, River Zuari does not meet the prescribed CPCB standard and Total Coliform exceedence in water samples of River Bicholim and River valvanti was observed throughout the year. The water quality data during the year is given in Annexure III.

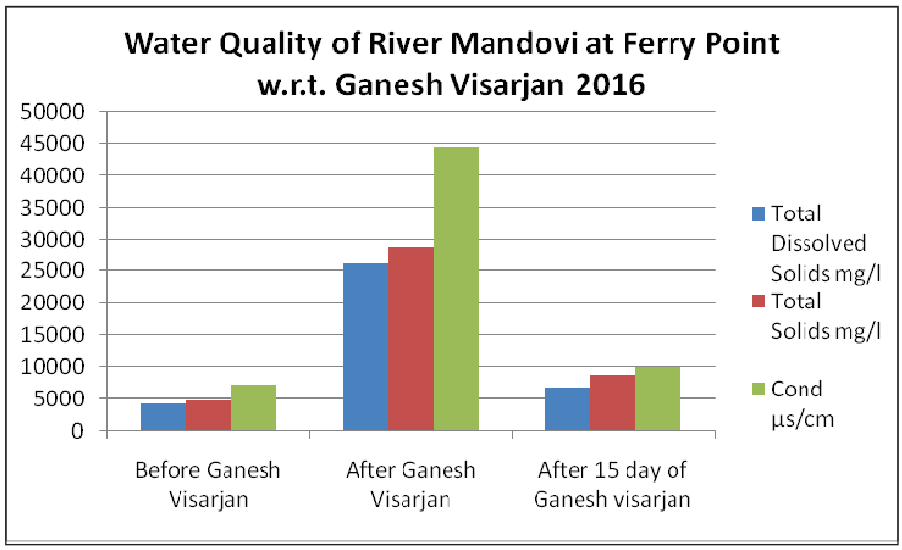
Figure 5.4 below is a map of Goa showing the water quality monitoring locations under National Water Monitoring Programme; MINARS. The monitoring locations are indicated as stars.

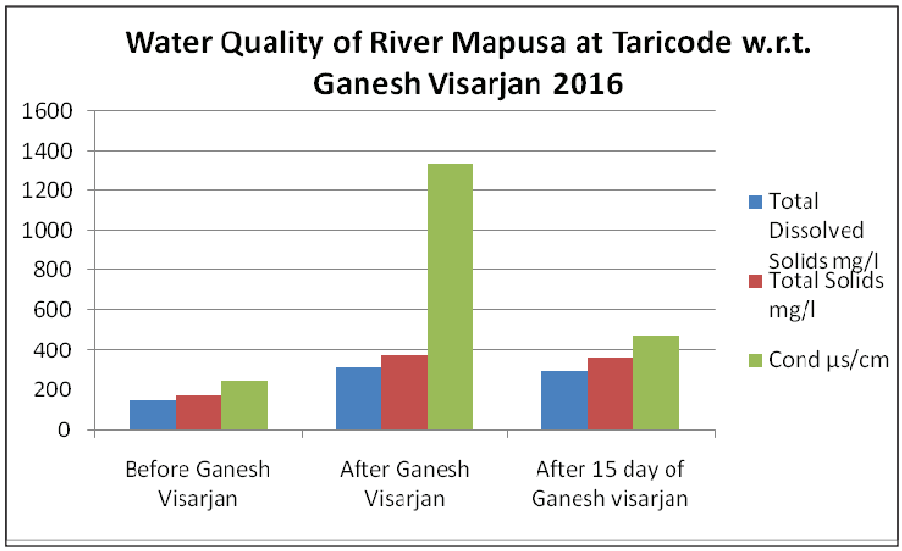
Figure 5.4 : Map of Goa showing the Water Quality Monitoring locations under the National Water Monitoring Programme; MINARS

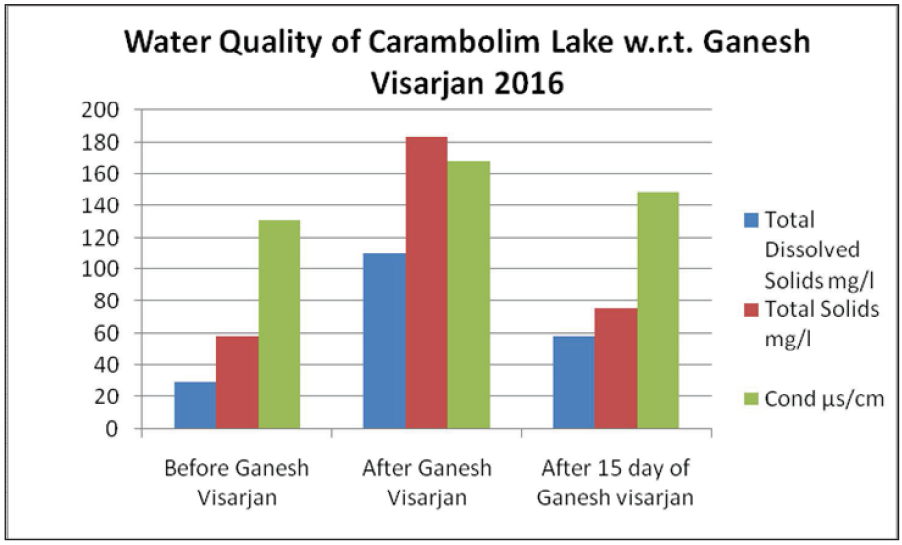
5.4 Monitoring of Water Quality Pre and Post Ganesh Visarjan

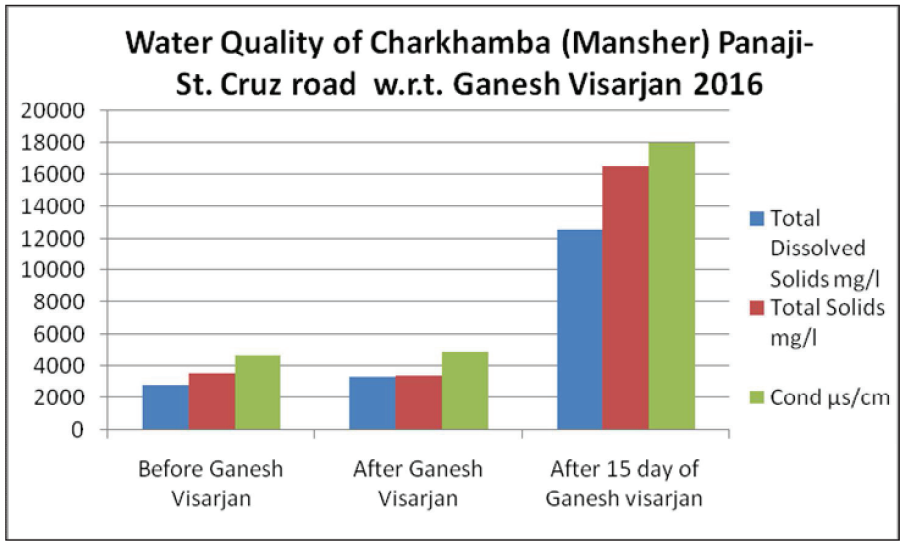
The Goa State Pollution Control Board also monitors water quality at 12 locations as per the directives of Central Pollution Control Board, Pre and Post Ganesh Visarjan. As per the water quality data given at Annexure IV the measured values indicate increase in Conductivity, Total Solids and Dissolved Solids post Visarjan.

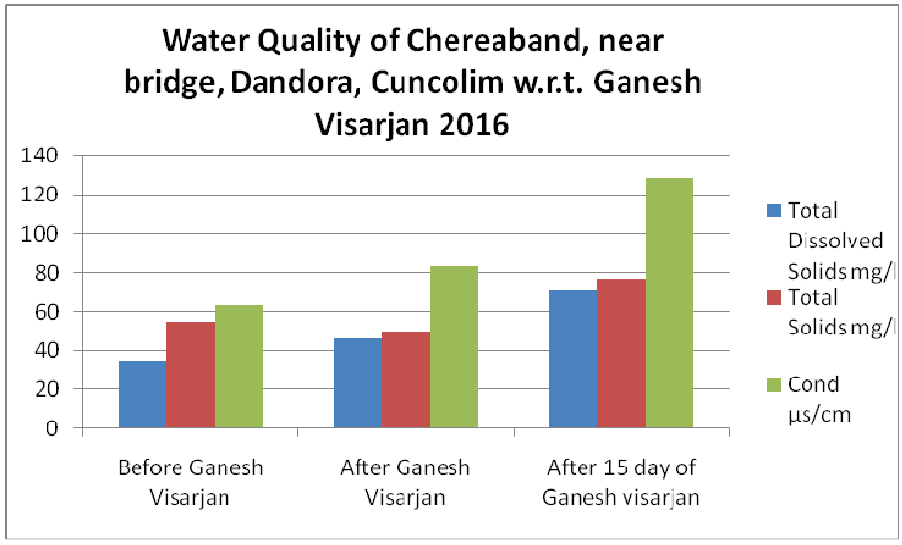
GRAPHICAL PRESENTATION WITH RESPECT TO THE WATER QUALITY AT GANESH VISARJAN PLACES IN GOA 2016

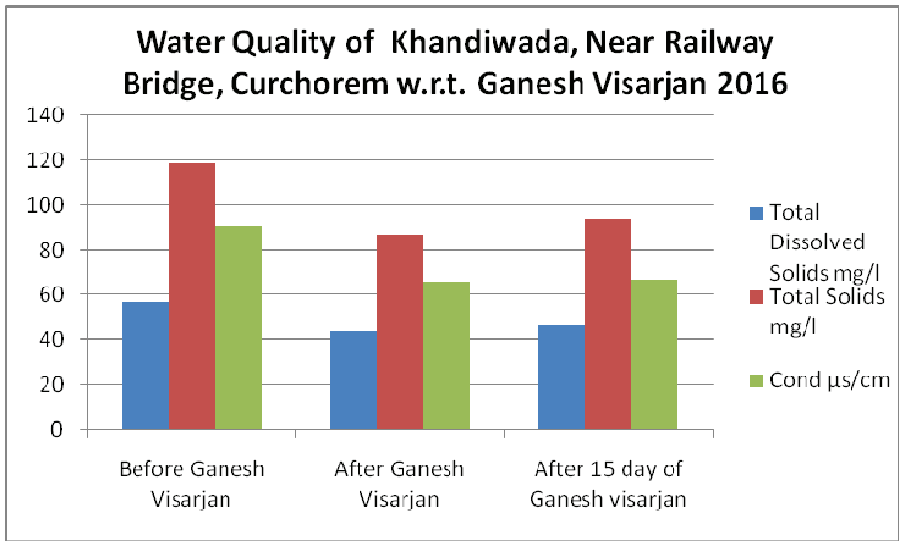


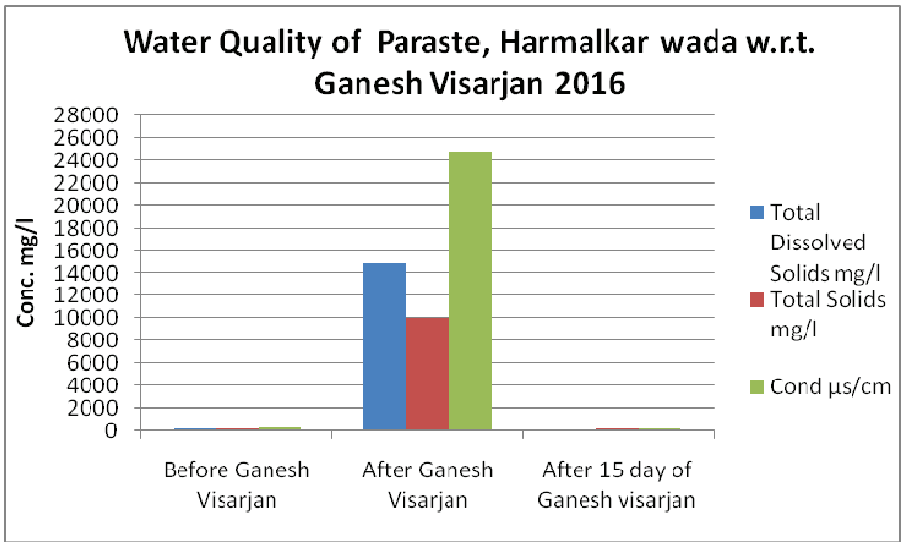


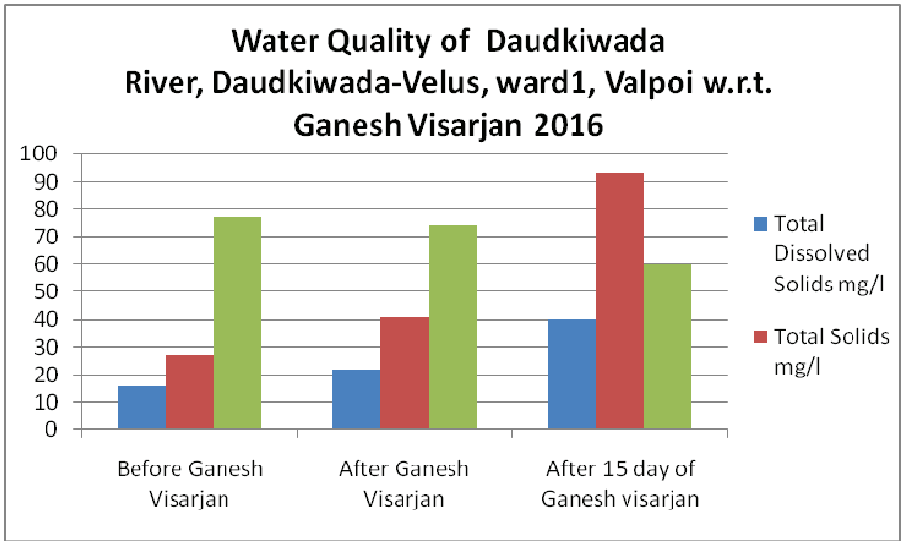


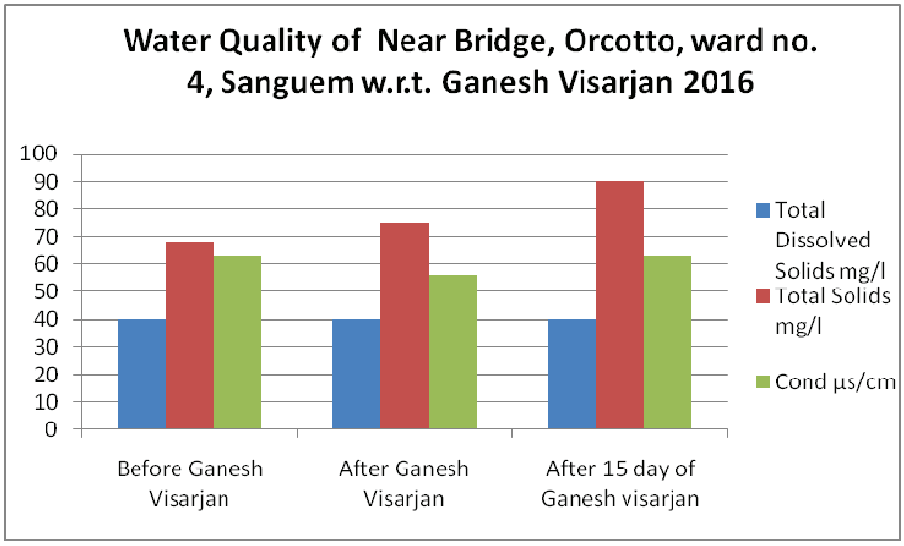

Water Quality of Charkhamba (Mansher) Panaji-St. Cruz road w.r.t. Ganesh Visarjan 2016
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

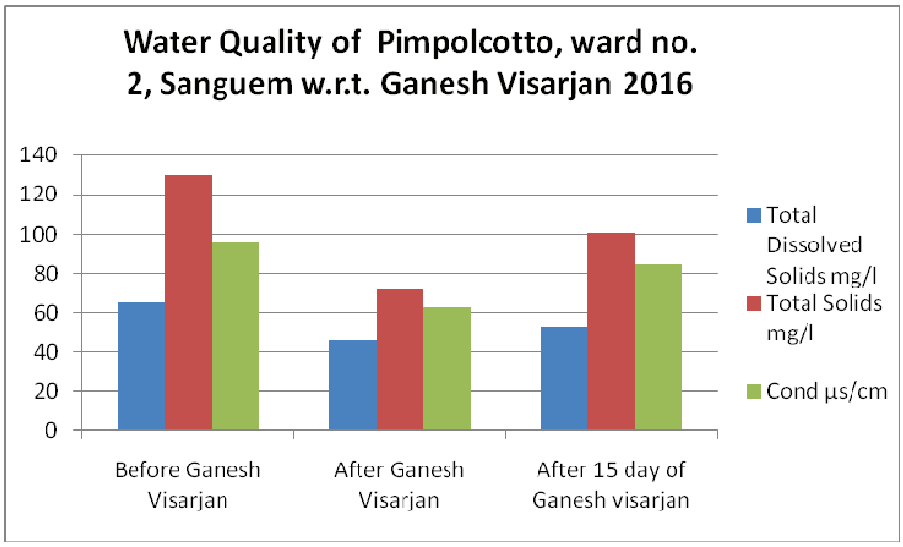

Water Quality of Chereaband, near bridge, Dandora, Cuncolim w.r.t. Ganesh Visarjan 2016
140
120
100
80
60
40
20
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

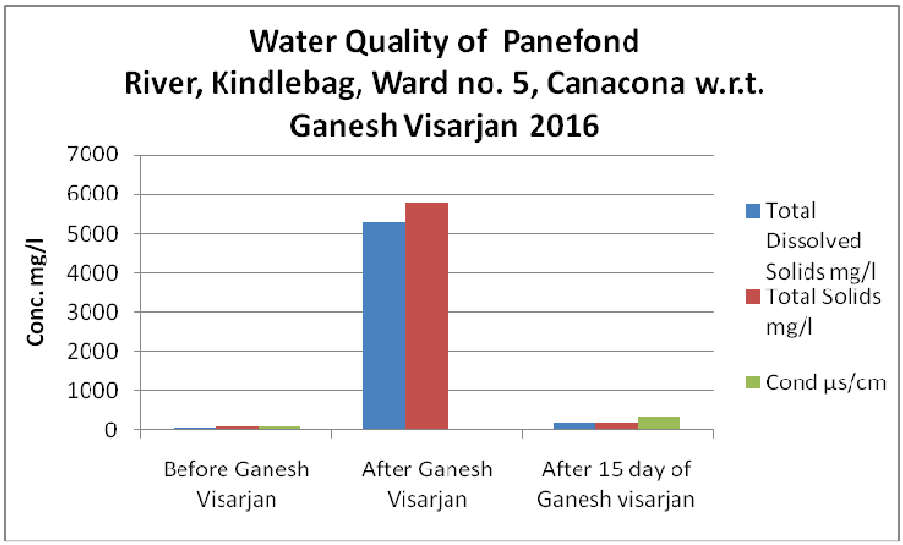

Water Quality of Khandiwada, Near Railway Bridge, Curchorem w.r.t. Ganesh Visarjan 2016
140
120
100
80
60
40
20
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

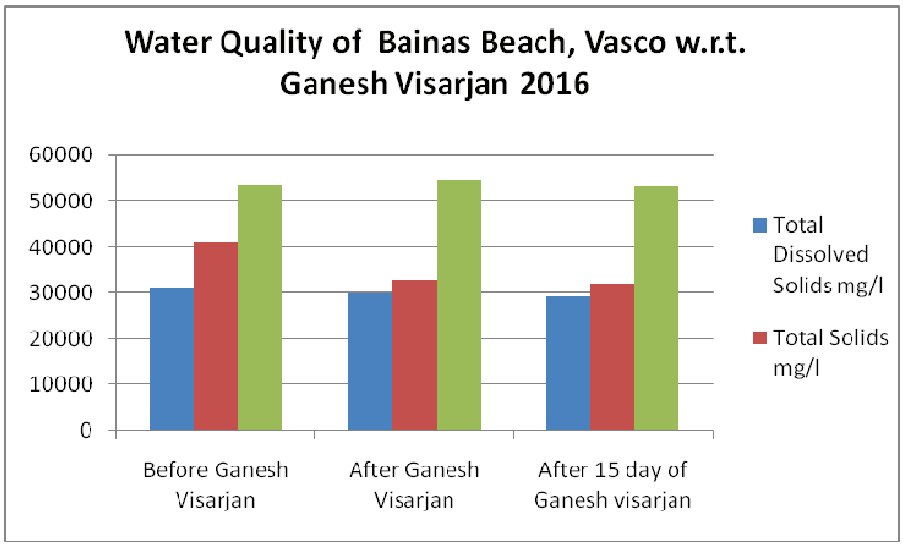

Water Quality of Paraste, Harmalkar wada w.r.t. Ganesh Visarjan 2016
Conc. mg/l
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

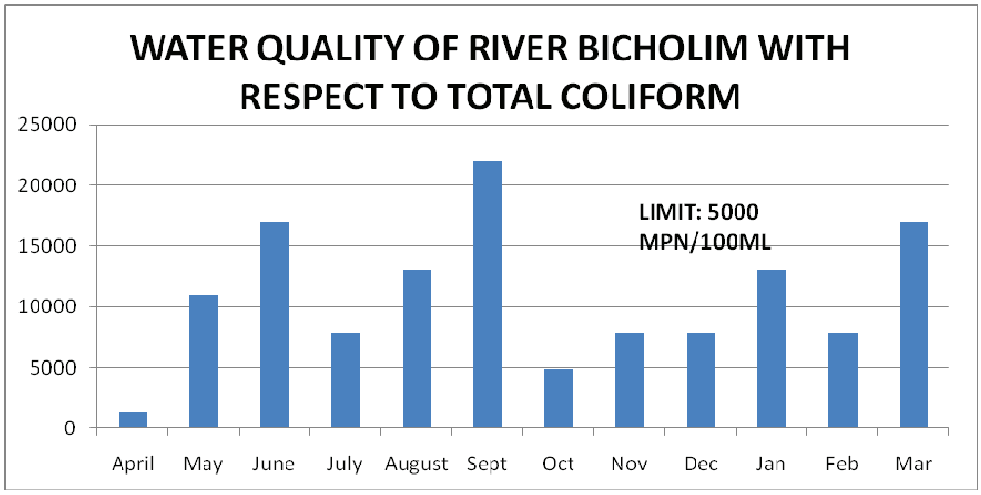

Water Quality of Daudkiwada River, Daudkiwada-Velus, ward1, Valpoi w.r.t. Ganesh Visarjan 2016
100
90
80
70
60
50
40
30
20
10
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l

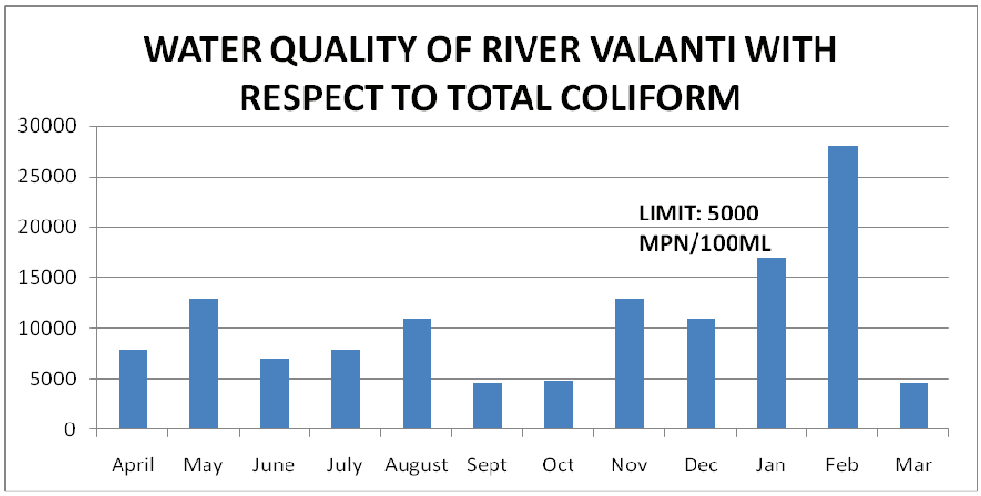

Water Quality of Near Bridge, Orcotto, ward no. 4, Sanguem w.r.t. Ganesh Visarjan 2016
100
90
80
70
60
50
40
30
20
10
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

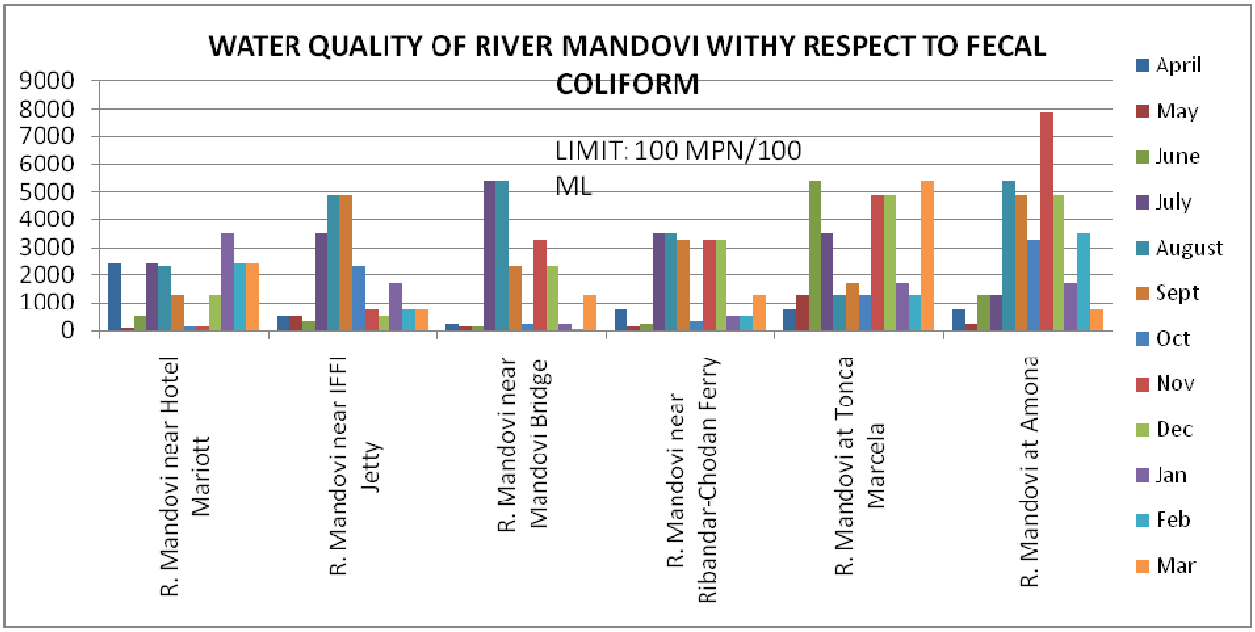

Water Quality of Pimpolcotto, ward no. 2, Sanguem w.r.t. Ganesh Visarjan 2016
140
120
100
80
60
40
20
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

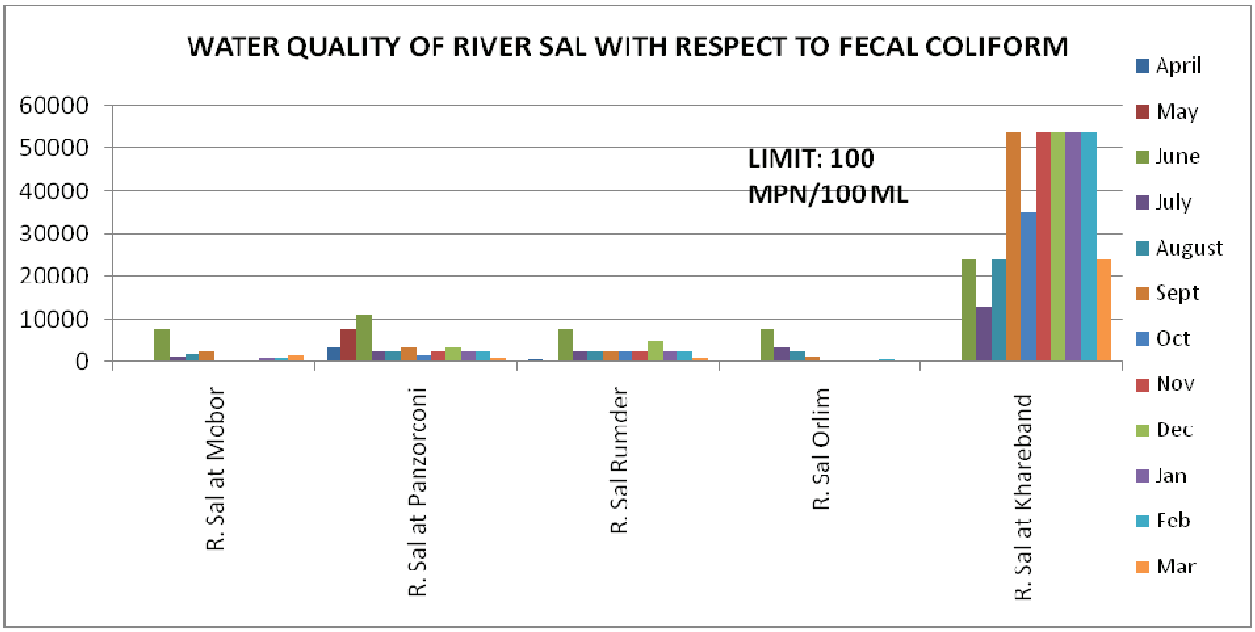

Water Quality of Panefond River, Kindlebag, Ward no. 5, Canacona w.r.t. Ganesh Visarjan 2016
Conc. mg/l
7000
6000
5000
4000
3000
2000
1000
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l
Cond µs/cm

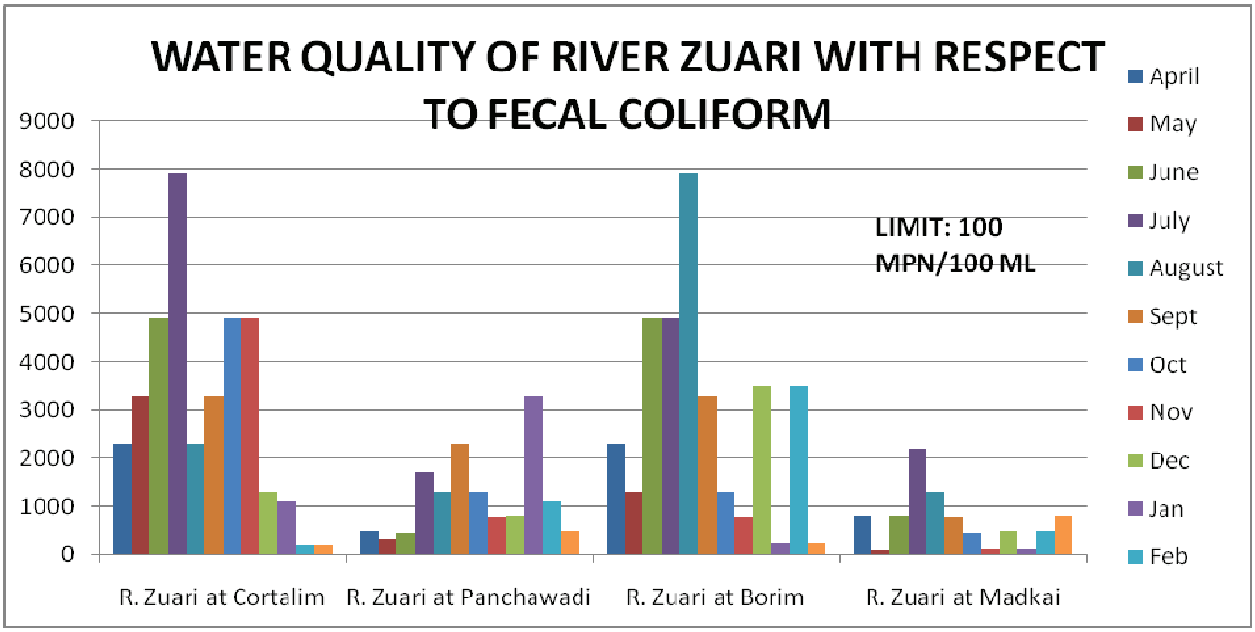

Water Quality of Bainas Beach, Vasco w.r.t. Ganesh Visarjan 2016
60000
50000
40000
30000
20000
10000
0
Before Ganesh Visarjan
After Ganesh Visarjan
After 15 day of Ganesh visarjan
Total Dissolved Solids mg/l
Total Solids mg/l


WATER QUALITY OF RIVER BICHOLIM WITH RESPECT TO TOTAL COLIFORM
25000
20000
15000
10000
5000
0
LIMIT: 5000 MPN/100ML
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb
Mar


WATER QUALITY OF RIVER VALANTI WITH RESPECT TO TOTAL COLIFORM
30000
25000
20000
15000
10000
5000
0
LIMIT: 5000 MPN/100ML
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb
Mar


WATER QUALITY OF RIVER MANDOVI WITHY RESPECT TO FECAL COLIFORM
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
LIMIT: 100 MPN/100 ML
R. Mandovi near Hotel Mariott
R. Mandovi near IFFI Jetty
R. Mandovi near Mandovi Bridge
R. Mandovi near Ribandar-Chodan Ferry
R. Mandovi at Tonca Marcela
R. Mandovi at Amona
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb
Mar


WATER QUALITY OF RIVER SAL WITH RESPECT TO FECAL COLIFORM
60000
50000
40000
30000
20000
10000
0
LIMIT: 100
MPN/100 ML
R. Sal at Mobor
R. Sal at Panzorconi
R. Sal Rumder
R. Sal Orlim
R. Sal at Khareband
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb
Mar


WATER QUALITY OF RIVER ZUARI WITH RESPECT TO FECAL COLIFORM
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
LIMIT: 100
MPN/100 ML
R. Zuari at Cortalim
R. Zuari at Panchawadi
R. Zuari at Borim
R. Zuari at Madkai
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb

CHAPTER 6

PRESENT STATE OF ENVIRONMENT, ENVIRONMENTAL PROBLEMS AND COUNTER MEASURES

During the year under report, the Board initiated various studies with respect to important issues. Some of the studies have been initiated by signing Memorandum of Association (MoU) with reputed Institutions / Companies and some are initiated by the Board Scientists. The details of the studies are as follows:

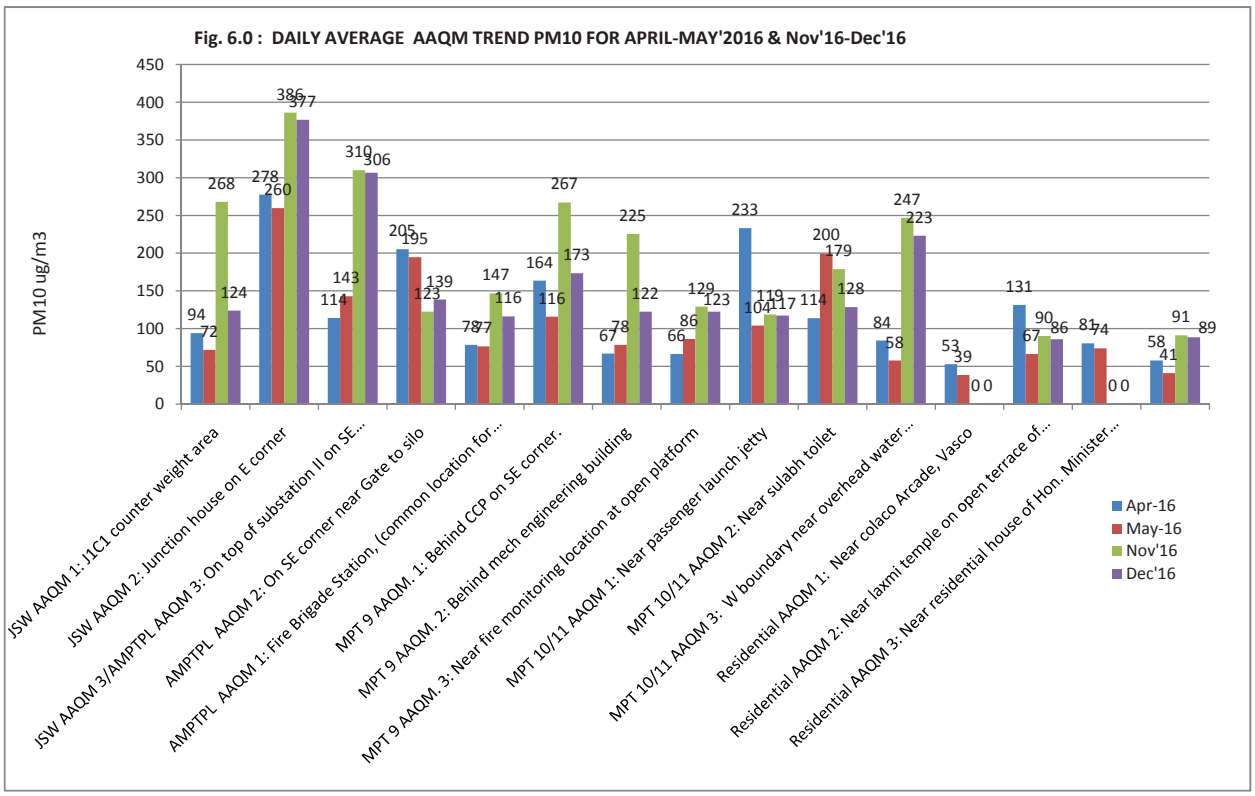
6.1 STATUS REPORT ON THE AMBIENT AIR QUALITY OF MPT PORT AREA

The air quality at the MPT area is being monitored by GSPCB, M/s SWPL and M/s AMPTL. The berths handling coal transport the same through rail and roads to their destinations pass through Vasco city. The Board has received a number of complaints regarding air pollution in the vicinity of the MPT port area from the public. Acting on the same, a status study was initiated by the Board in Feb'2016, the findings of which are given as under

In order to ascertain the same , the Board initiated an Ambient Air Quality study in and around the immediate vicinity of MPT Port Area, including Vasco city, in light of the coal handling activities of MPT Port. And to further correlate it, to the to the compliance of Board Consent Conditions and Board direction to reduce coal handling by 25% in order to ascertain that the reduction in coal handling can impact the existing dust pollution noted and improve the air quality. 15 AAQM locations were identified and monitored March'2016 to May'2016, and post Monsoon from Nov'2016 to Dec'2016 as listed below:

Site No.	Name	AAQM
1	J1C1 counter weight area Lat.: 15°24'54.70"N Long.: 73°47'42.05"E	JSW Berth 5A&6A: AAQM1
2	Junction house on E corner Lat.: 15°24'47.70"N Long.: 73°47'52.60"E	JSW Berth 5A&6A: AAQM 2
3	On top of Sub Station II on SE boundary (DSS2) Lat.: 15°24'43.60"N Long.: 73°47'49.00"E	JSW Berth 5A&6A: /Adjacent to Berth 7 AMPTPL (Common location) AAQM 3
4	MPT Fire Brigade Station Station- NAMP Location Lat.: 15°24'33.12"N Long.: 73°47'48.66"E	Near to Back up Area of Berth 7 :: AMPTPL AAQM 1
5	On SE corner, near Gate to Silo Lat. 15°24'26.60"N Long.: 73°48'2.50"E	AMPTPL Berth 7: AAQM 2
6	Behind CCP on SE corner Lat.: 15°24'23.70"N Long.: 73°48'11.50"E	MPT Berth 9 AAQM 1
7	Behind Mechanical Engineering Bldg D18/57 Lat.: 15°24'26.34"N Long.: 73°48'14.38"E	MPT Berth 9 AAQM 2
8	Nr Fire Monitoring location at open platform Lat.: 15°24'38.10"N Long. 73°48'1.20"E	MPT Berth 8 AAQM 3
9	Next to Passenger Launch Jetty Lat.: 15°24'17.12"N Long.: 73°48'24.87"E	MPT Berth 10 : AAQM 1

10	Near Sulabh toilet Lat.: 15°24'1.71"N Long.: 73°48'28.94"E	MPT Berth 11 : AAQM 2
11	Near Overhead Water Storage tank Lat.: 15°23'56.41"N Long.: 73°48'20.25"E	Back up area of MPT Berth 10/11 AAQM 3
12	On Colaco Arcade Lat. "15°23'46.53"N Long.: 73°48'18.89"E	Residential
13	Near Laxmi temple,on top of Sulabh toilet, Khariwada Lat.: 15°23'58.26"N Long.: 73°48'39.03"E	Residential
14	Near residential house of Hon'ble Minister for Power, Shri Milind Naik	Residential
15	Fuse Call Office Lat.: 15°23'51.66"N Long.: 73°48'41.76"E	Vasco City



This study initiated for compliance status of the Board issued Consent conditions and establish the AAQM trends in and around MPT indicated that the AAQM standard for monitoring as per schedule VII of the Environment Protection Rules 1986 as amended were excceding for the said monitoring period and further indicates that exceedances have occurred on two or more consecutive days of monitoring, which is in violation of the said standard .

The SO2 and NO_2 data were found within stipulated limits.

Most of the locations monitored within the MPT showed more than 45 % (approx.) exceedances on the days of monitoring especially w.r.t PM10 as noted in the monitoring period especially Nov'16. (Refer Table 22) where an exceedance of almost 80 % is observed.Though these AAQM locations were at the perimeter of activities, the activities themselves are performed very close to the perimeter with negligible or non existent defined buffer zones between the activity itself and the the adjacent residential areas. The highest impact observed was at a residential location was in Khariwada and in Vasco city (Near Municipality) and to a lesser degree at lower Jetty.

The Particulate Matter was found to be more or less consistently high in MPT area with the highest AAQM levels observed in Berth 5 A-6A(M/s JSW) and Berth 7 M/s AMPTPL) berths .

The following activities are evident at the MPT Berths and are possible contributory sources :

1. Train emissions
2. Stock piling of (coal, coke, woodchips, bauxite etc)
3. Stackers
4. Loading/unloading activities (coal, coke, woodchips and related dust, bauxite, ore dumps , coal conveyor systems, ship loading/unloading, grabs, mobile relaimers , use of heavy machinery , excavators etc.)
5. Truck movement
6. Ship emissions

RECOMMENDATIONS:	
	The port operations include – 1. Dry Bulk Storage & Handling 2. Liquid Bulk Storage & Transfer (Loading/Unloading) 3. Non-bulk Chemical Storage & Handling 4. Port Cargo Handling Equipment & Rail/Truck Operations Powered by Diesel Engines 5. Vehicle & Equipment Fuelling 6. Management of Hazardous and Non-hazardous Waste Generated by Port/Tenant Activities 7. General Operations that can Impact Neighboring residential/commercial Areas like Noise, Light, Odor, Trash, Dust. 8. Berths Maintenance
	Taking the above into consideration:
1	The MPT, AMPTPL, JSW may be directed to further streamline their coal /ore /wood chip handling activities in such activities by directing primarily MPT and its lease holders to:
a.	Take into consideration Best Available Technology (BAT) or Good International Industry
	Practices (GIIP).w.r.t DUST MANAGEMENT when determining air quality management techniques ,generally and in specific cases, including during expansion or up gradations.

b.	Use enclosures (detachable if required) on conveyors or chutes and telescoping arm loaders, hoppers to reduce spillage and dust; also, minimize the distance between the working area and trucks/trains being loaded to reduce the area exposed to fugitive dust generation and area that has to be swept/ cleaned. Free fall of material should be avoided
c.	Cover the cargo stock pile with an impervious tarpaulin , adequately anchored , as soon as possible after loading/ unloading and adjusting the cover as material is removed from the pile thereby ensuring maximum closure of the pile and minimum exposure to existing weather conditions
d.	Maintain pile size/volume to maximum height specified by the Board or consistent with customer demand, transportation schedules and materials cost , whichever is lesser , to reduce the amount of material exposed to weather conditions; and for the shortest time as possible. Dry cargo pile heights should remain low, to minimize material from becoming airborne.
e.	Insert the ship loader or loading mechanism in the ship's hold before loading/unloading begins. All ship loader booms should be fitted with fogging sprays at the loading chute.
f.	Divert stormwater/run-off around the stock pile with drainange channels or impermeable perimeter berms (Compacted clay is preferably preferred over either concrete or asphalt as it is less likely to crack, therby preventing groundwater infiltration[2];) , tyre washing areas, channelling the run off into adequately sized and suitably lined holding tanks prior to disposal post treatment and compliance to stipulated standards.
g.	Periodically clean the drainage channels and properly dispose of the sediment as per applicable regulations. Storm drainage channels/holding tanks should not be discharge directly into surface waters without prior Consent of the Board and compliance verification..
l	Wash down or spray the underside and tires of trucks/other vehicles suitably bermed allotted areas transporting dry bulk materials/otherwise and complete cover of the cargo prior to exiting on to public roads to reduce dust transfer and fugitive emissions
j.	Use dust suppression systems , bag house, screw conveyors and vacuum collecting equipment wherever practical in the handling and further prevention of dispersion of fine, granular or powdery material
k.	Establish the Dust Extinction Moisture (DEM) for the various cargoes handles as applicable and ensure that all ore/coal/bauxite/sawdust/other powder form of material (directly or indirectly derived) brought into, stockpiled and unloaded/loaded through the MPT is at, or above, the Dust Extinction Moisture (DEM) for that particular material type. DEM, as well as any specific characteristics such as hydrophobicity which would indicate that practices relying on water application would be effective enough or ineffective. Both the DEM and the hydrophobicity of ore/coal/
	bauxite/ sawdust/other powder form of material (directly or indirectly derived) should be determined and the reports of the same should be submitted to the Board including their respective Material (or mineral) characteristics of the bulk material.
l.	Use Water cannons/sprinklers on all stockpile areas to maintain the Dust Extinction Moisture (DEM) of the product and prevent dust emissions associated with wind erosion. Use of low-volume misting nozzles directed along the raw material stream. Use of water addition nozzles in conjunction with the low volume misting nozzles where the raw material is not at DEM.
m.	Explore the use of total or partly retractable permanent enclosures for stock pile handling areas , during loading /unloading or installation of an additional windscreen (height to be established keeping in mind, the elevation height of the hill top residences and the structural stability of the same) adjacent to the road adjoining MPT and the residences , whichever is feasible , for control of dust generation with extraction to suitable bag or appropriate filters to minimize fugitive dust emissions, thereby controlling material loss.

n.	Consider predominant wind patterns when stock piling, avoiding dry and windy conditions where possible. Spray stockpiles immediately prior to strong wind events or dry weather conditions
o.	Consider removal of materials from the bottom of piles to minimise dust re-suspension .
p.	Regularly vacuum clean the docks, and handling areas, trucks, rail storage areas, and paved roadway surfaces.
q.	In Mobile reclaimers , the bucket wheel reclaimers can be fitted with two sets of nozzles (one set to spray the face of the stockpile immediately ahead of and behind the cutting wheel, and the second set to spray into the raw material stream as it cascades out of the buckets into the transfer chute and onto the conveyor
r.	All roads/handling/storage areas within MPT premises are regularly cleaned and maintained (including truck/rail routes) on a daily basis.
s.	Where practicable during expansion, designing new facilities to minimize travel distance from ships off-loading and on-loading facilities to storage areas.
t.	Provide details of water source for sprinklers and provide flow meters to the sprinkling systems line and submit daily readings of input and out put at the end of the month to the Board
u.	TRAINS/TRUCKS to :
i.	Change to advanced clean diesel fuel, such as low or ultra low ulphur diesel (LSD) (ULSD), emulsified diesel, bio-diesel, compressed natural gas, liquefied natural gas, or any other such cleaner fuel etc. As applicable and appropriate
ii.	Retrofit or install “after treatment” devices on existing equipment, such as diesel particulate filters, oxidation catalysts, closed crankcase ventilation, selective catalytic reduction, lean Nox catalyst, exhaust gas recirculation, idle reduction devices.
Iii	Replace an older engine or heavy machinery with a newer, cleaner engine or machinery , especially one that can use alternative cleaner fuels and/or has been
	manufactured to stricter on-road emission standards; like hydraulic hybrid vehicles or opt for a min. Bharat IV compliance engine and properly maintain engines.
iv.	Initiate incentives for emissions reduction in leases and contracts with, contractors and transportation service providers;
v.	Distribute and publicize contact information (phone/fax numbers, e-mail addresses, mailing addresses) of the MPT representative (A Senior Personnel) to encourage direct readdressal of inquiries and reporting complaints related to pollution ; This contact person should be responsible to receive/follow-up on inquiries/complaints; and their satisfactory closure.
vi.	Implement dust suppression measures for unpaved roads on port areas , including spraying recycled water at frequent intervals during use and regulating road use till a more permanrent solution is achieved.
vii	Ensure strict cargo vehicle speed to max. 40 kilometres per hour in habited premises and <10kmph within port premises
vii	Green belt (minimum ht of 5 mtrs) to be enhanced along all port boundary perimeter to serve as a secondary barrier
viii	Avoiding or limiting the practice of vessel blowing exhaust while in port or during unfavourable atmospheric conditions and ensuring current and valid PUC’s for trucks/vessels/train engine, as per applicable regulation or engine design which ever is applicable
x.	Conduct Dust and noise abatement (decibel reduction) study to measure dust/noise from fixed and mobile sources and at the port/leased boundaries to establish general trend map for further assessment and submit the same to the Board .

xi	Reduce engine idling during on- and off-loading activities

v.	**VESSELS:**
i.	MPT to maintain Emissions of Nox and Sox within the limits established by international regulations MARPOL by using low-sulfur fuels in port,
ii	Navigation of port access areas at partial power, achieving full power only after leaving the port area o
iii	Avoid or limit the practice of blowing soot from tubes or flues on steam boilers while in port or during unfavourable weather conditions
w.	NOISE
i.	Noise sources in ports include cargo handling, vehicular traffic, and loading / unloading containers and ships to be identified, controlled and regulated within defined time frames keeping in view the distribution of population density.
2	Permanently stabilize entire Port work areas/transportation routes to minimize fugitive dust emissions within three months from date of order. Consideration may be given to the use of compacted clay , due to its low tendency to crack , in consultation with concerned experts.
3	The Units operating in the respective Berths may be directed to jointly install an additional CAAQMS in a residential area on the eastern and southern side which shows presence of high particulate matter levels
4	Particulate matter to be analysed & characterised to ascertain the source/fingerprinting through source apportionment studies at cost to MPT- Underway
5	Assessment of coal handling activities by an industry expert at the cost of MPT and report to be submitted to the Board.
5.1	An evaluation of the exceeded data ,correlated with activities on site, for determination of root cause and its respective corrective and preventive action.
5.2	To enhance handling capacities only after remedial measures have been successfully adopted , implemented and verified.
6	Additionally , the following may also be adopted,as recommended in the last report .
6.1	M/s JSW
a.	The CAAQMS Installed by JSW on the terrace of the canteen building was also directed (Ref No. 1/25/15-PCB/9893 dtd 23/03/16) to be shifted due to its unsuitability w.r.t. wind directions and noncompliance of siting guidelines. Due to non availability of space as per the AAQM guidelines, a new location was proposed at “Proposed CAAQMS” as referred in Annexure IA. The new location shall either be constructed on an approx. 5 mts above the ground concrete column and platform with safety railing and suitable access or mounted on the existing water tank.
b.	Though housekeeping was considerably better, JSW was asked to extend the good housekeeping scheme to its train/truck loading area within its premises.
6.2	M/S AMPTPL
a.	Good housekeeping requires to be maintained by AMPTPL within its premises especially along its rail/road transportation routes.
b.	The CAAQMS Installed by Adani near the MPT guest house building was also directed (Ref No. 1/25/15-PCB/9893 dtd 23/03/16) to be shifted due to its unsuitability w.r.t. wind directions and noncompliance of siting guidelines
6.3	MPT
a.	To submit an explaination on their non compliance to initiating AAQM till date MPT to initiate immediately the AAQM in their respective berths as required under their respective Board Consents – Pending
b.	To be directed to apply for Consent for their activities at Mooring Dolphins , Transhipper and any other activity carried out by the port upto the territorial limits off shore
c.	To control the over all loading/unloading operations and authorize suspending unloading and handling operations during unfavourable weather conditions (precipitation, wind) that could, otherwise, increase run-off or fugitive emissions, restrict noise generating activities at night;

d.	To provide a survey outlay of its boundary to re-establish the AAQM siting locations of the MPT AAQM Operators
e.	To install an additional CAAQMS to the Board identified area and make them fully functional and submit compliance report on the same including calibration details.
f.	MPT to ensure that Port operation activities conducted are in accordance with applicable international regulations and standards, and submit the same to the Board, including
i.	International Labour Organization (ILO) Code of Practice for Safety and Health in Ports (2005);
ii.	General Conference of the International ILO Convention concerning Occupational Safety and Health in Dock Work·, C-152, (1979)
iii.	General Conference of the ILO Recommendation concerning Occupational Safety and Health in Dock Work, R-160;
Iv	IMO Code of Practice for Solid Bulk Cargo (BC Code);
v	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code);
vi	Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code);
vii	International Maritime Dangerous Goods Code (IMDG Code). Physical Hazards
7	The Board Consent to MPT/JSW/AMPTPL anther Port users handling dust generating cargo may further be amended to include the following:
7.1	The requisite Height limit for the stock pile in relation to the installed wind screen and wind screen location based on predominant seasonal wind directions, which should be a min. Of 5 mtrs above the stock pile height and should be of suitable knitted material capable of retaining moisture used in conjunction with Dry Fog systems to facilitate the agglomeration and settling of dust thereby minimizing dispersion.
7.2	Periodically clean the drainage channels and properly dispose of the sediment as per Sch VI , of EPA and Rules 1986 as amended. Storm drainage channels/holding tanks should not be discharge directly into surface waters only after compliance to applicable parameter levels
7.3	Compulsory use of wheel washing system for wash down or spray the underside and tires of trucks/other vehicles and total cover of cargo while transporting dry bulk materials/otherwise prior to exiting the berths, on to public roads to reduce dust transfer
8	MPT Medical Service can initiate a co-oordinated health study along with the Directorate of Health services as a part of their Corporate Social Responsibility (CSR) either individually or jointly , which can further ascertain the possible progressive health effects of Dust particulates on the local residents.
9	All Berth operators/handlers are to forward the Material Safety Data Sheets (MSDS) of all cargoes handled at port, duly stamped by manufacturer or related authorized agency.
10	The Board may also determine the applicability of Board Consent to third party users(like M/s Vedanta) of Port facilities like mooring dolphin or any activity occurring anywhere within the territorial jurisdiction of Goa's off shore waters.
11.	The Goa State Pollution Control Board (GSPCB) requested the National Institute of Oceanography (CSIR-NIO) to provide assistances and expertise in their studies on particulate matter concentrations due to coal handling at the Mormugao Port Trust area, Mormugao Goa . The GSPCB Officials along with Dr. Ramaswamy visited MPT on 23/03/16. The NIO Report was submitted by Dr. Ramaswamy, Sr.Scientist on Coal dust concentrations in MPT.

6.2 MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN THE GOA STATE POLLUTION CONTROL BOARD (GSPCB) AND BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (BITS)

Memorandum of Understanding (MoU) was signed between the Goa Satte Pollution Control Board (GSPCB) and Birla Institute of Technology & Science, Pilani (BITS) on 5th June 2014. The MoU between BITS and GSPCB is signed with the objective of fostering collaboration between the two organizations to promote academic interaction. The course has been completed. The abstract of the projects undertaken by the Board officials is indicated below:

Sr. No.	Name of Official	Dissertation Title	Summary
1	Mr. Digvijay Desai	Determination And Prediction Of State Of Environment-Goa	The Study gives an introduction to Goa including the historical background, administrative setup, riverine/ estuarine waterways, forest cover, geology, climate and rainfall, tourism, mining, land use/ land cover, transport network and brief about other economic activities. The report gives an insight on water resources of Goa. The chapter includes water resources, surface water resources, ground water resources, aquifer types, groundwater recharge and discharge, rainwater harvesting and rainwater augmentation, water resource structures and water supply scheme in the State. A part of report reviews the air quality in the State of Goa. It includes brief on definition of air, ambient air quality, sources of air pollution, national ambient air monitoring programme and statistical analysis of the NAAMP data. The study also gives an insight on water quality in the State of Goa. It includes brief on definition of water and water quality, sources of water pollution, national water monitoring programme and statistical analysis of the NWMP data.

2	Mr. Shashank Dessai	Design Of Fume Hood Collection System For Induction Furnaces	Fume hoods are widely used to capture air contaminants (gases & particles) emitted from a source. As hood collects contaminants, significant amount of ambient air also gets collected. As the distance of the collection hood and the source increases, the suction of ambient air also increases. Efficient fume hood collection system is important to provide healthy working conditions and to meet emission standards. In this work a new fume collection hood system is proposed for the Induction Furnace. As the fume generation depends on the quality of raw material used that is sponge iron, pig iron and scrap iron, the study includes removal of impurities from scrap iron so as to minimize the fumes generation during melting of iron. Fume hood designed will be able to collect fumes emitted during entire melting cycle. A comprehensive study on the air pollution control system adopted by the induction furnace industries was conducted. The effectiveness of vertical fume hood system and conventional canopy hood system was studied. Vertical fume hood system is more effective as compared to conventional canopy hood system. New design of hood system is proposed based on the study conducted to further improve the effectiveness of fume collection system. It was observed that generation of fumes is mostly due to impurities present in raw material (metal scrap), hence study was conducted to eliminate the impurities present in raw material by leaching. It was observed that sulphuric acid leaching was much effective than hydrochloric acid and nitric acid to remove rust and red-oxide coat from scrap materials.
3	Ms. Lee Ann Antao	Phytoremediation- A Case Study Using Vertical Flow Constructed Wetland For Treatment Of Laundry Wastewater	The performance of a two stage vertical flow wetland planted with Canna Indica was studied particularly for removal of organics and suspended particles. The raw wastewater mixed with starch powder was added to the system and the average BOD removal efficiency of 93.96% was achieved with an average COD removal efficiency of 93.41%. The percentage removal efficiency of TS, VS, DS and SS was found to be 35.8%, 82.8%, 25.2% and 89.5% respectively. The plant growth was not deterred during the experiment conducted after addition of starch. The study showed that a two stage vertical flow constructed wetland is effective for the removal of COD, BOD, SS for a loading of 30 lts on a total area of 0.56m2. The study can be further extended to arrive at the ideal loading rate by increasing the loading of wastewater to the system. The loading which gives satisfactory results of organic matter and suspended particle removal for corresponding area requirement can be considered as the ideal loading rate. Also the plant characteristics need to be studied in terms of plant growth measured by leaf and stem growth.

4	Mr. Nikhil Caeiro	Sustainable Management Of Municipal Solid Waste: A Case Study Of Goa	This study pertaining to Solid Waste Management for State of Goa has been carried out to evaluate the current status and identify major problems. Various adopted treatment technologies for Solid Waste were critically reviewed, along with their advantages and limitations. The objective of the study is to examine and compare different technologies and methods available for dealing with treatment of such Solid Waste and suggest most favorable methodology for the state of Goa. The study is concluded with a few fruitful suggestions, which may be beneficial to encourage the competent authorities/researchers to prioritize initiatives towards improvement of the present system. Field visit to the Municipal Solid waste (MSW) Treatment plants and collection of data with regards to inputs and outputs in the process/ methodology have been carried out. Also the study to examine the present status of waste management in Goa has been attempted, the Environmental fallout, if any, and the prospects of introducing improved means of disposing solid waste is studied in later stages of the project. Also the study & comparison of the operation of the two Municipal Solid waste Treatment plants located in Goa. i.e. The MSW management treatment plant at Saligao and MSW treatment plant at Sonsoddo is carried out in later stages so as to ascertain feasibility of adopting suitable technology.

5	Mr. Amit Shanbag	Life Cycle Assessment Studies In Methyl Bromide Production And Tyre Production	LCA is a tool to evaluate the environmental impacts of any product or a process. In an LCA study all the aspects of the product right from the extraction of the raw materials, processing of the same, transportation to the product manufacturing facility, manufacturing of the product, its use and the eventual disposal is considered for the estimation of impacts on the ecology. The study can be divided into four major steps: defining the goal and scope of the study, life cycle inventory, life cycle impact assessment and finally the interpretation of the results based on the previous three steps. The LCA tool can be very useful in product development, process selection and modification, marketing claims and advertising and corporate strategy planning. In this study, the two industries were considered for the estimation of the environmental impacts, namely Intech Pharma which produces Methyl Bromide (MeBr) and MRF Industries which deal with the production of vehicle tyres. LCA study in the production of MeBr has been carried out using both the LCA approaches namely “gate to gate” and “cradle to grave” while the manufacture of tyres has been studied using only the “gate to gate” approach. In both the LCA studies it has been observed that the considerable impact on the environment with respect to the impact categories of “global warming” and “non renewable resources” is due to the widespread use of fossil fuels in the utilities for the electrical power generation and steel production. Burning of fossil fuels also has significant contribution towards respiratory inorganics due to the generation of particulate matter emissions. The LCA results can be used for the purpose of suitable modification in the process and utility operations to minimize the environmental impacts. This may include change in fuel use to reduce load on renewable energy and best available technology for the emission control.

6	Mr. Manoj Kudalkar	Alternative Material / Method For Separation Of Oil From Water To Address Hydrocarbon Pollution	An oil spill is accidental or incidental release of hydrocarbon (petroleum product) into the environment. The term "oil spill" is usually referred to release of liquid petroleum hydrocarbon into water bodies i.e. the ocean or sea which may occur due to releases of crude oil or refined petroleum products (such as gasoline, diesel) and their by-products or the spill of any oily refuse or waste oil. The discharge of oil to the environment due to human activities though intentionally or by coincidence results in negative environmental, social & economic consequences. These oil spills have proved lethal for the terrestrial, marine & coastal ecosystems. This study takes overview of some of the oil spill episodes witnessed by the mankind such as oil spill occurred from M V Sea Transporter at Sinquerim, Goa in 1994, M V Prapti in Goa in 2005, collision of M V Chitra & M V Khalija at Mumbai in 2010, etc. The study envisages understanding of the type of hydrocarbon spilled in these incidents, their properties etc. The study further envisages the experimental study of separation of different types of oil from different qualities of water with the help of absorbents. The study concludes with the result showing the behaviour of different types of oil in different qualities of water which will help in selecting the methods / material for separation of oil from water.
7	Mr.Abner Manuel Rodrigues	Effective Solid Waste Management In A Single Household Using Anaerobic Digestion Or Composting	The Study involved comparison between a household anaerobic digester and a composting unit for treating the kitchen waste generated from a single household. At the outset a model of a household anaerobic digester was designed using a simple plastic container having a total volume of 74 ltr. The digester was designed in such a way that 75% of the volume of the digester occupied kitchen waste and the remainder 25 % for accumulation of gas generated. The digester was initially filled with existing digestate (75 % of the volume of the digester) from the biogas plant of the Birla Institute of Technology and Science Pilani(BITS Pilani) Goa Campus. The waste generated from a single household was grinded in a paste form and then added to the digester on daily basis(500 gms to 800 gms per day). The biogas generated per day was quantified using a water column where biogas logged was 8.8 ltrs from 8.00 a.m to 3.00 p.m. Considering that maximum production of gas would dung this time period we can assume that the production of biogas per day will be around 20 ltrs. The biogas was also analyzed for its composition where methane content was averaging 45.7 %. Similarly the digestate that was generated in the process was also quantified and analyzed. Subsequently a composting unit was set up for treatment of kitchen waste generated from a single household. The waste was added to the composter on daily basis. Addition of waste was stopped on the 24th day and the pot containing waste was kept for curing. On the 35th day the contents of the pot were emptied and analyzed for compost composition. The cost of construction of both the systems was also estimated and results were discussed.

8	Mr. Sanjay Kankonkar	Monitoring Of Heavy Metals In Seafood Sample In Goa	The coastal area of Goa is exposed to several sources of pollutants . Predominantly from human activities. It was proposed to identify whether sea food (oyster, clams, prawns and crabs) in Goa waters are really free from heavy metals or not. It was proposed to study the levels of heavy metals in certain shellfishes at the coastal areas of Goa to ensure the safety of the shellfish. Recently, marine environmental pollution with heavy metals (cadmium ,copper, Lead ,and Zinc) has garnered public attention, especially in coastal areas. Metals generally enter the aquatic environment through atmospheric deposition, the erosion of a geological matrix or as by products of anthropogenic activities such as industrial effluent , domestic sewage and mining waste. Because of increased urbanization and industrialization , the anthropogenic inputs of metals currently exceed the natural inputs. The marine sediment in coastal areas or bays and seawater play an important role as an agrochemical discriminator reported that heavy metal pollution is of special concern because these metals are non-degradable and therefore persist in the ecosystem. Fifteen sampling station for Oyster, twelve sampling station for Clams were selected and five random sample each of Prawns and Crabs were collected to analysed the content of trace metals. In order to understand the changes occurring with respect to metals sampling were carried out during monsoon and post monsoon season. Fifteen different sampling station were selected for the collection of oyster and clams sample from the coastal areas of Goa during monsoon and post monsoon season. Five different samples for prawns and crabs were collected. Nine different metals was analysed for the aforesaid specified sample. Simultaneously water sample were collected from above fifteen location for the identification of metals profile in water. In oyster cadmium, Zinc ,chromium, lead and copper was much higher as compared with the standard of shellfish. A few isolated elevated concentration were observed in Fe, Mn, Ni and Co concentration. The concentration of metal content in water was much below the permissible level. In clams cadmium, zinc and copper concentration was at elevated side as compared with shellfish standard. The concentration of other metals was much below the permissible limits. Lead content in prawns was at higher side whereas other metals remain

9	Mr. Bento Thomas	Water Quality Assessment In State Goa A Case Study Using GIS As A Tool	The Project is aimed in assessing water quality of state of Goa-India using GIS as a tool. The IDW interpolation method was used for spatial distribution of parameters. Time manager animation gives visual representation of water parameters over five years from 2012 to 2016. Along with GIS water quality index is used to assess the water quality due to influence of some parameters. The Goa State Pollution Control Board under National Water Quality Monitoring Programme (NWMP) monitors water quality at 52 locations with various parameters out which 10 parameters are selected for the analysis i.e pH, Turbidity, DO, BOD, Chlorides, Total Dissolved solids, Hardness, Nitrate, Sulphates & Total Colifrom. QGIS platform is used to model the maps of water quality for individual parameters. The case study on the water quality analysis carried out on Rivers across state of Goa. The data was collected from the annual reports of Goa state Pollution control board. The data is arranged into tabulated format in excel. Geographic information system (GIS) is used to represent the spatial distribution of the parameters and raster maps were created. Time manager animation gave visual representation of ten parameters over last five years the analysis was carried for last five years from 2012-2016. The water quality index for 14 Class C Category Rivers are carried out and comparison is done for 2014-15 and 2015-16 years. The water quality index indicated that most of the sampling locations come under good category indicating the suitability of water for human use whereas Creek Dando at Mormugao is unfit for drinking since the water quality index showed rating more than 300. This may be due to the anthropogenic sources.
10	Mr. Ganpat M. Naik	Sequential Batch Reactor (SBR) Decentralized Waste Water Treatment Plant For Domestic Waste Water- A Case Study	The proposed set-up of on-site installation of SBR technology at M/s GKB Visions Pvt. Ltd., was completed within the period of 06 months from June to November 2016. During the tenure of the proposed study, the pilot-scale plant was set-up using locally available material such as two Sintex tanks (capacity – 1000 and 500 lts.), feed pump with 2HP and 1HP, air blower having 15 m3/hr., sand filter as well as PVC-pipes and fittings on actuals. The inlet wastewater was fed as made available from septic tank of the said unit and was equalized in the equalization tank (500 ltr. capacity) which was fed to SBR tank of 1,000 ltr. capacity. Then the cycle was allowed to run in batches of 1 hr. / 6 hrs. and 1 hr. and then was subjected to decantation through sand-filter. Subsequently, the samples were collected and analyzed at its inlet as well as outlet points for desired parameters to ascertain the physico-chemical characteristic of wastewater. The data obtained has been presented and interpreted in the preceding chapters. On interpretation of the same, it was observed that the treatment methodology complies with the prescribed treated wastewater standards as per the CPCB norms as well as provisions of the EPA Acts / Rules made there under.

11	Mr. Nilesh Parsekar	Study On The Degradation Of Metformin By Thermal Activation of Persulphate	In this study, degradation of Metformin drug of concentration 100µmol/L by thermal activation of persulphate is investigated by Spectrophotometric method. The peak of Metformin absorbance is observed at 233.5nm. The experiments to achieve degradation of Metformin drug is carried out at room temperature, at 60^0C and at 80^0C. At room temperature, there is no reduction observed in the absorbance measured for 1 hr for degradation by all the three concentrations of KPS used in the experiments. Since the molecule of the Metformin is stable, it was difficult to degrade by KPS alone at room temperature. The experiment is further carried out by thermal activation of persulphate at temperatures 60^0C & 80^0C. The % degradation of Metformin drug at temperature 60^0C & 80^0C indicates that the degradation of Metformin enhance at higher temperature and at higher concentration of KPS. Maximum degradation by 2mmol/L of KPS at temperature 60^0C in 4 hrs is observed as 83.1 % and 100 % degradation at temperature 80^0C in 2 hrs. At temperature 80^0C, there is high possibility of forming most numbers of sulphate radicals which indicates significant reduction and degradation of Metformin drug when mixed with KPS. TOC degradation in 100µmol/L of Metformin drug by 0.5mmol/L, 1mmol/L & 2mmol/L of KPS at Room temperature and at 60^0C indicates no decrease in TOC values. However by 0.5mmol/L, 1mmol/L & 2mmol/L of KPS at 80^0C, there was decreased of 3.9 %, 33.0 % & 52.2 % degradation of TOC values respectively. The study indicates the formation of degraded intermediate and the activation of persulphate by thermal activation has the ability for remediation of water contaminated with Metformin.

12	Mrs. Anny Dias	Leachate Bioremediation Using Combination Of Aerobic And Anaerobic Treatment Methods	The purpose of this study was to identify a feasible treatment system incorporating Anaerobic and Aerobic treatment processes for bioremediation of leachate generated at the composting plant located at Patto inorder to achieve an effluent that meets regulatory disposal standards.The composting leachate was fed to an Anaerobic reactor stepwise in a volume of 0.1l every day and the volume gradually increased to 0.5l with a retention time of two days at the end of the experiment resulting in a stepwise increase in the loading rate of the reactor from 730.0mg to 13,000.0mg of Chemical Oxygen Demand (COD)/l at the end of 3 weeks. The treated effluent collected was then fed to an SBR (Sequential Batch Reactor) in two successive cycles (0.5 l per cycle). Possibility of biogas generation and efficiency of the treatment system for reduction in pollutant concentration was investigated by measuring the pH, total suspended solids (TSS), COD, Biochemical Oxygen Demand (BOD), Nitrogen and Phosphorus compounds and Biogas composition. The combination of anaerobic & aerobic treatment processes shows 96-98% reduction in COD, BOD and solids and a 72-96% decrease in nutrients. However H2S was found to be major constituent of the gas generated during anaerobic digestion in the experiments indicating that anaerobic digestion of leachate proceeds through the sulphate reduction pathway. The study demonstrates inhibition of methane generation due to the presence of sulphates, producing an effluent which still needs further polishing to meet regulatory standards for disposal. This can be achieved either by adding a tertiary treatment step after SBR or having a pretreatment step before anaerobic digestion to remove solids. The second approach is likely to be more favourable due to its potential for energy recovery through methane generation which will eliminate the production of the corrosive H2S gas, decrease settling issues in SBR & drastically reduce the contaminant concentration for anaerobic digestion.

13	Mrs. Livia D'Silva	Bioreme-diation Of St. Inez Creek Using Vertical Wetlands	The St. Inez creek water at different locations was analysed for its physical, chemical and bacteriological characteristic and the analysis reports indicated that various physico-chemical (organic load) and bacteriological parameters are exceeding permissible limits of Class 'B' waters under which the creek has been categorized. Based on the analysis data, bioremediation of the creek using vertical flow constructed wetlands was attempted at one location (kamara bhat site) inorder to verify the effectiveness of vertical wetlands in treating the creek waters. Therefore drum experiment for vertical wetlands was setup onsite which consisted of three levels of sand and gravel placed top to down in the drum, perforated pipe inserted inside the drum for providing aeration and a garden tap affixed at bottom as outlet for collection of sample. Initially loading rate of 30 litres of creek water sample per day was maintained for two week then gradually it was increased to 40 litres per day. Sample was collected weekly before and after treatment through vertical wetlands and analysed. The analysis reports indicated that there is 90-99% reduction in BOD and dissolved oxygen was also meeting the prescribed standards except for bacteriological parameters which showed reduction however it is not meeting the prescribed standards. Hence it has been verified from the above project vertical wetland is found to be effective in decreasing the organic load and improving the water quality, thereby meeting the prescribed standards of the 'Class B' category, whereas further reduction in the microbial content can be achieved by integrating the vertical wetlands coupled with any disinfection system as a post treatment which can be taken up in future scope.

14	Mrs. Nandan Prabudes-sai	Modeling Of Discharge Of Treated Waste Water From The Sewage Treatment Plant In The St Inez Creek	The modelling study was carried out of a creek located in the mids of Panaji City. This creek is a storm water drain. Now the creek is become a dumping ground of garbage and sewage. The flushing of the creek was not occurring. The Sewage Treatment Plant operated by Public Works Department was discharging treated waste in the River Mandovi. The Board directed the treatment plant to discharge the treated effluent in the creek so as to unable flushing in the creek. However no modelling study was carried out to understand the effect of the discharge on the creek water. Dissolved oxygen and biological oxygen demand are two parameters considered mainly for the study. During this modelling study many papers were reviewed. It was observed that not much study is carried out in India with regards to Modelling of discharge in water body. On perusal of the papers it was observed that the studies have widely used softwares like MIKE, WASP 5, QUAL II etc were used for the study. The present study carried on the creek indicates that the measured dissolved oxygen values are less than the predicted values using mathematical model. The recommendations were made in the report to 1. The flushing of the creek to be permitted by lowering the culvert levels. 2. The sewage or any other discharge in the creek should be collected prior to discharge and treated in the STP. 3. Desilting of the creek should be carried out. 4. The local authority to ensure that no solid waste is dumped in the creek. 5. The treated sewage should be utilised for construction activity/gardening and the remaining to be disposed in the creek. 6. The treated sewage should be disposed fully in the creek during monsoon. 7. The drains leading into the crek to be connected using pipes and treated in Sewage Treatment Plant at Tonca.

15	Mr. Keshav Fadke	Pilot Study On Vermi-Remediation Of Hazardous Waste Residue Of M/S Sunrise Zinc Ltd.	M/s. Sunrise Zinc Ltd., an industry located in Cuncolim IDC was closed by High court due to hap-hazard dumping of hazardous waste. The industry accumulated about 50,000 metric tons of hazardous waste containing high concentrations of heavy metals such as Cadmium, Zinc, Chromium, Nickel, Mangnesium, Iron, cobalt and Aluminum. The waste is still lying untreated and there is a fear of leaching of these heavy metals in sub soil, thereby polluting the ground water. Hence, a lab scale study to ascertain efficiency of heavy metals through vermiremediation was proposed to establish uptake of heavy metals in their tissues through bio-accumulation. Concentrations of heavy metals in the waste were prior ascertained. One set up of hazardous waste with the organic matter having beneficial microbes and earthworms was made. Another set up of hazardous waste with the composted organic matter, without having any beneficial microbes and earthworms was made. The results obtained from both the set ups were compared with the initial concentrations, which provided information about the reduction in concentration due to vermiremediation, and an inference could also be drawn if the same happens merely by dilution. Referring to the results obtained from the analysis of the samples analysed, it is seen that the mixture kept for ten days gives erroneous results. Hence, is not considered for interpretation. Referring to the other results, it is seen that although there is a slight reduction in the metal contents in comparison to that of the raw sample. However, since the sample with only composted organic matter (without addition of beneficial microbes) also show decrease in metal content, it is necessary that an extensive study be carried out.

16	Mrs. Jenica Sequeira	Analysis And Treatment Of Fish Processing Effluent By Persulphate Based Advanced Oxidation Processes	This research contributes to the study of advanced oxidation processes applied to the fish processing water waste. The need to restore water for new uses makes purification of wastewater practically essential to achieve a desired degree of quality. The treatment of wastewater in the fish processing industry is one of the major environmental problems. The main environmental problems of fish industries are high water consumption and high organic matter, oil and grease, ammonia and salt content in their wastewaters. The generated fish wastewater is rich in oil and grease, salt and ammonia. Biological treatments of such wastewater render them harmless. Biological contaminant concentrations range from 2400-9500 mg/l (COD), from 2200-6650 mg/ (BOD), from 393- 534 mg/l (NH3), from 600 –1362 mg/l (TOC). One of the physical contaminants is odor. Odors in fisheries wastewaters are caused by the decomposition of the organic matter that emits volatile amines, diamines and sometimes ammonia. Advanced oxidation processes have been reported to be effective for the degradation of organic contaminants and inactivation of bacteria. In the first case aniline was treated with different known concentrations at elevated temperature to evaluate the degradation. Aniline was successfully degraded by the persulfate (2 mmoles/L) over 3 hrs at a temperature of 80°C. The results showed that higher temperature was more favourable for complete degradation of aniline. In the second case the study investigated the parameters like BOD, COD, TOC and NH_3 and their degradation with persulphate. The fish effluent was subjected to treatment by oxidants such as potassium persulphate (KPS). The results indicate that oxidation treatment indicates a very high COD, BOD and TOC removal. The main conclusions is degradation rates/ removal % reaches 60% to 76% for COD, 73% to 98% for BOD, about 12% NH_3 and 28% TOC removal for raw water waste and 16% to 37% COD, 53% to 98% BOD, 38% to 77% NH_3 and least 6% TOC removal for treated water waste. It is preferred to apply a biological process as a first treatment followed by advanced oxidation with persuphate as a final polishing step, as the most fraction of the original effluent is biodegradable. The results obtained have demonstrated that the oxidation with persulphate can lead to BOD removal very efficiently as high as 98% with final effluents that can be reused, rejected in the water streams or discharged on land. Results further indicate that the persuphate is effective in degradation or removal of the organic pollutants.

17	Mr. Pravin Fal Dessai	Pilot Study On Phytoremediation Of Hazardous Waste Residue Of M/S Sunrise Zinc Ltd.	Human activities like mining, transport, agriculture, industrial waste disposal release inorganic pollutants in high concentrations that are toxic to natural ecosystems. Heavy metal pollution causes potential ecological risk. M/s Sunrise Zinc Ltd,an industrial unit had dumped its hazardous waste residue at Cuncolim Industrial estate. Pilot scale phytoremediation study was conducted with the said Hazardous waste residues. Phytoremediation study was carried out with 30 kg of hazardous waste collected from the dump. Vertical wetland with Cana Indica Plant was constructed. The 30kg of waste was leached with acidic water at 2.6 pH. Sulfuric acid was used to lower the pH. The leached concentrated was transferred into the vertical wetland. The said activity was conducted for 10 days. Also simultaneously water leach of the 12 kg of waste was carried out separately to understand leaching of heavy metals with water. Leaching of Heavy metals such as Cu, Cr, Pb, Ni, Cd and Fe were higher at acidic pH as compared to water leaching. Whereas in case of Zn, Co and Mn, with acidic and water leaching doesn't show much variation Study indicated that there was not much considerable reduction in the Cu,Co,Mn,Ni& Fe concentration in the wetland. Zinc 16%,Lead 45% and Cd 19% reduction was achieved in the wetland. Hazardous waste sample were analyzed for TCLP before and after the treatment. It was observed that there was a reduction of heavy metals after 10 days of leaching operations. It was noted that approximately 57.7%AL, 59% Cadmium,33% Cobalt,41% Copper,48% lead,74% Mangnesium,31% Nickel,56% Zinc and 49% Chromium reduction was achieved with 10 days of leaching. Whereas there was not much reduction in manganese concentration. During the said study an experiment was conducted by changing the pH value from acidic to alkaline. The acid leachate and wetland treated samples were collected. pH value recorded was 4.1.Sodium Hydroxide was added to increase the pH to more alkaline 11.5. It was noted that heavy metal concentration of acidic leachate and wetland sample were reduced by precipitation. Cu, 92.8%, Zn63%, Pb 66.48%,Co57.42%,Ni 92.60%,Cd 95.86%,Mn 64.12%,reduction was achieved in acidic leachate by increasing the pH values. Whereas incase of Fe, there was not much change. Cu 98.33%,Zn 93.59%,Co 80.%,Ni 98.13%,Cd 98.13% and Mn 94.70% reduction was achieved by increasing the pH values of wetland treated sample. Also Experiment was carried out with three different acid and at four different pH values. Sulfuric acid (inorganic acid), Hydrochloric Acid (inorganic acid) and Acetic acid (organic acid) were used for leaching. Leaching was carried out at 2,3,4 and 5 pH values. With increase of pH, the leaching concentration of heavy metals by inorganic acids

18	Mr. Rohan Ramesh Nagvekar	Source Apportionment Study Of Mormugao Port Trust Area And Its Immediate Vicinity"	Air pollution is one of the major problem faced by locals within the vicinity of Mormugao Port Trust, Mormugao. The Goa State Pollution Control Board receives many general complaints from the locals regarding Air pollution in the vicinity of Mormugao Port Trust (MPT) area. Air pollution problem becomes complex due to multiplicity and complexity of air polluting sources such as Industries, Diesel generator sets, automobiles, domestic fuel burning, road side dusts. Air quality is influenced by various sources and their emission rates. The sources of air pollutants include vehicles, industries, domestic sources and natural sources. Mormugao Port Trust (MPT) handles general cargo, Petroleum and chemical products, Bauxite, Coal, Iron ore and ManganeseThe Mormugao Port Trust is known for handling and export of iron and manganese ore. However after the mining ban in the year 2012, iron ore handling through this port has reduced considerably and there has been increase in the handling of coal. Coal is handled by MPT at berth no. 5, berth no. 6 and berth no. 7. The Berths handling coal transports the same through rail and roads to their destinations through Vasco city. The Board had directed the Mormugao Port Trust to reduce coal handling by 25% as decided during its 119th meeting held on 28/01/2016 in order to ascertain that the reduction in coal handling can impact the existing dust pollution and to improve air Quality. The Source apportionment study is primarily based on measurements and tracking down the sources which helps in identifying the sources and extent of their contribution to Ambient Air Pollution. Strategies for sector specific pollutants need to be drawn from scientific evidences which are concrete and clear. These facts can be derived from the use of techniques such as emission inventory, dispersion modelling and finally prioritization based on cost effectiveness analysis of varied options. The Source apportionment study includes preparation of emission inventory of different sources of air pollution, estimation of emission loads (EL), monitoring of ambient air quality at selected locations and preparation of database. The contribution of air pollutants in the air by various sources in an area can be assessed in two ways. One is through the calculation of emissions from various source categories using emission inventory data and the other is the estimation of percent fraction contributed by different source categories to ambient air using receptor modelling tools such as factor analysis technique and chemical mass balance. This projects attempts to identify the emission sources such as point source, line source and area source and to ascertain location specific impact due to multiple sources of air pollution at Mormugao Port Trust (MPT) area and its immediate vicinity by estimating emission loads using emission

19	Mr. Vishwendra A. Naik	Alternative Methodology For Treatment of Non-biodegradable Waste From Sanitary Products To Produce Densified Products For Energy Applications	While operating the mechanism of collection of non-biodegradable waste in the State, the disposal of domestic sanitary waste poses serious difficulties. Since Sanitary waste (Sanitary pads, adult and baby diapers etc.) are part of Municipal Solid Waste under clause 3.41 under SWM rules 2016, there are no clear guidelines for handling and treatment/disposal methods of the same. They are either disposed by landfilling or incineration since only limited recycling processes are being implemented. Some scientific studies indicated that the raw material composition of recent sanitary products is compatible with biological treatments and with composting in particular. However, some studies recommend that the sanitary products should not be composted with other household bio-waste because of the difficulty in separating the biodegradable and synthetic components of the product. In this study Literature survey as well as Research work has been carried out to understand characterization of various polymeric materials used to manufacture of sanitary products and accordingly suggested the alternative methods to treat the non-biodegradable material present in the sanitary product. Chapter 5 gives the methodology adopted to characterise the polymers used in the sanitary napkins. Chapter 6 gives the effective treatments to recycle the polymers used in the sanitary products.
20	Ms. Edma Fernandes	Degradation Of Dyes By Thermal Activation Of Persulphate	The Degradation Potential Of The Widely-Used Industrial Dyes- (I) Methyl Blue And (Ii) Methyl Orange By Persulphate-Based Advanced Oxidation Processes (AOP's) Was Investigated Using Spectrophotometry. The Results Show That Dye Degradation (I.E. Discolouration/Dye Removal) By Persulphate (KPS) Was Found To Be Kinetically Slow. Among Persulphate Activation Methods, Thermal Activation Is The Least Well-Studied, Hence An Attempt Was Made To Assess The Effectiveness Of Thermal Activated Persulphate On Dye Degradation. Accordingly, Thermal Activation Of Persulphate Was Conducted At 60°C Wherein 100% Decolourisation Of The Methyl Blue Dye (6.7 µm) Was Achieved In 90 Minutes And 86% Decolourisation Of The Methyl Orange Dye (33 µm) Was Achieved In 180 Minutes As Compared To Room Temperature Of 25°C For Both Dyes. Thus, The Degradation Of The Dye With Persulphate Was Much Faster In The Presence Of Heat. Dye Degradation Efficiency Also Increased Rapidly With Increasing Concentration Of Persulphate. It Was Noted That 100% Methyl Blue Dye Degradation With 2 Mm Thermal Activated KPS Was Attained In One Hour While, Complete Methyl Orange Dye Degradation Was Attainable In 2 Hours. Lower Concentrations Of Thermal Activated KPS (0.25 Mm, 0.5 Mm, And 1 Mm) Took More Time For Complete Dye Degradation. Thus, Higher The Thermal Activated Persulphate Concentration, Higher And More Effective Is The Dye Degradation Efficiency.

6.3 ANNUAL REPORT OF STACK MONITORING FOR THE YEAR APRIL 2016 TO MARCH 2017

During the year under report, the Goa State Pollution Control Board conducted Stack Emission Monitoring programmes for 36 stacks in 08 different industries within the State of Goa. The units mostly comprise of induction furnaces, reheating furnace, boilers, Cement Mill and Thermic Fluid Heater. The details of the stack emission monitoring conducted are presented below.

Table 6.1: Details of Stack Emission Monitoring conducted during the year

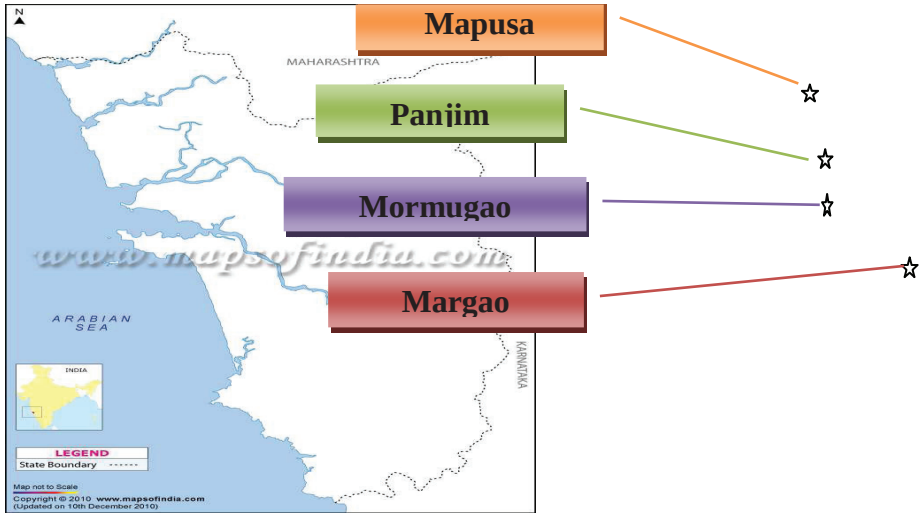
Sr. No.	Area	Industrial Area	Name of Unit	Type of Stack	Date of Sampling
1	-	Madkaim Ind. Estate	M/S. Sun Pharmaceuticals Industries Ltd	Boiler (850 kg/hr)	04.04.16
2	-	Kundaim Ind. Estate	M/S. Shivam Ispat Pvt Ltd	Induction Furnace	06.04.16
3	-	Kundaim Ind. Estate -	M/S. Mohit Steel Industries Ltd	Induction Furnace	11.04.16
4	St. Jose de Areal, Salcete – Goa	-	M/s Goa Carbon Ltd,	Cooler	18.05.16
5.	St. Jose de Areal, Salcete – Goa	-	M/s Goa Carbon Ltd,	Rotary Kiln (1,00,000MT/annum)	20.05.16
6.	-	Kundaim Ind. Estate	M/s Prateek Alloys Pvt Ltd	Induction Furnace	24.05.16
7.	-	Kundaim Ind. Estate	M/s Hitek Brass Products Pvt Ltd	Induction Furnace	17.10.16
8.	Village Colvale , Bardez -Goa	-	M/s Goa Glass Fibre Limited	Glass Melting Furnace (55MT/day)	19.10.16
9.	-	Kundaim Ind. Estate	M/s Mandovi Casting Pvt Ltd	Induction Furnace	24.10.16
10.	Santona Village , Sanguem - Goa.	-	M/s Shraddha Ispat Pvt Ltd	Rotary Kiln (100T/day)	26.10.16
11.	-	Kundaim Ind. Estate	M/S. Himgiri Casting Pvt Ltd	Induction Furnace	31.10.16
12.	-	Radhakrishna Industrial Estate	M/s Goa Steel Ltd	Induction Furnace	02.11.16
13.	-	Pissurlem Ind. Estate	M/s Esteem Industries Pvt Ltd	Boiler (3T/hr)	07.11.16
14.	-	Kundaim Ind. Estate	M/s Hindustan Unilever Ltd.	Boiler (4T/hr)	09.11.16
15.		Pissurlem Ind. Estate	M/s VIC Industries	Boiler (2T/hr)	28.11.16

16		Bicholim Industrial Estate	M/s Mohit Ispat Ltd	Reheating Furnace	30.11.16
17.		Pissurlem Ind. Estate	M/s Suraksha Packers Private Limited	Boiler (4T/hr)	05.12.16
18.	Village Navelim , Bicholim - Goa.	-	M/s. Vedanta Limited (Sinter Plant)	Pig Casting Machine (cast house de dusting)	12.12.16
19.	-	Pissurlem Ind. Estate	M/s. Ambey Metallic Ltd	Rotary Kiln	14.12.16
20.	Amona village , Bicholim - Goa.	-	M/s. VEDANTA LIMITED (Waste Heat Recovery Plant)	Waste Heat Recovery Boiler No. 1 (64 tons/hr)	21.12.16
21.	Amona village , Bicholim - Goa.	-	M/s. VEDANTA LIMITED (Waste Heat Recovery Plant)	Waste Heat Recovery Boiler No.2 (64 tons/hr)	23.12.16
22.	-	Pilerne Industrial Estate	M/s. Sandu Pharmaceuticals Ltd.	Boiler (3.0T/ hr)	30.12.16
23.	Navelim, Bicholim-Goa	-	M/s. VEDANTA LIMITED (Waste Heat Recovery Power Plant-2)	Waste Heat Recovery Boiler No.1 (65.00 tons/hr)	02.01.17
24.	Navelim, Bicholim-Goa	-	M/s. VEDANTA LIMITED (Waste Heat Recovery Power Plant-2)	Waste Heat Recovery Boiler No.2 (65.00 tons/hr)	04.01.17
25.	Amona Village, P.O.Marcela-Bicholim,Goa.	-	M/s. VEDANTA LIMITED (Pig Iron Plant)	Hot Blast Stove (2 & 3)	12.01.17
26	St. Jose de Areal, Salcete-Goa	-	M/s. Goa Carbon Ltd,	Rotary Kiln (1,00,000MT/ annum)	31.01.17
27.	St. Jose de Areal, Salcete-Goa	-	M/s. Goa Carbon Ltd,	Cooler	07.02.17
28.	Amona Village, P.O.Marcela-Bicholim ,Goa.	-	M/s. VEDANTA LIMITED (Pig Iron Plant)	Hot Blast Stove (1 & 3)	01.03.17
29.	Ponda -Goa	-	M/s. MRF LIMITED (UNIT I)	Boiler (20T/hr) (G-196)	06.03.17

30	Ponda -Goa	-	M/s. MRF LIMITED (UNIT I)	Boiler (25T/hr) (G-94)	08.03.17
31	-	Cuncolim Industrial Estate	M/s. Shirdi Steel Re-Rollers Pvt Ltd	Reheating Furnace (6-8 T/hr)	15.03.17
32	Ponda -Goa	-	M/s. MRF Ltd (Unit II)	Thermic Fluid Heater I – 686 (6lakh kcal/hr)	17.03.17
33	-	Honda Industrial Estate	M/s. Fresenius Kabi India Private Limited	Boiler (10.00T/hr)	20.03.17
34	-	Honda Industrial Estate	M/s. Fresenius Kabi India Private Limited	Boiler (3T/ hr)	22.03.17
35	-	Honda Industrial Estate	M/s. Fresenius Kabi India Private Limited	Boiler (6T/ hr)	27.03.17
36	Ponda -Goa	-	M/s. MRF Ltd (Unit II)	Thermic Fluid Heater II – 603 (6lakh kcal/hr)	29.03.17

The results of the stack emission monitoring indicate that the emissions from the flue gases are within the permissible limits except for five stacks for which the emissions exceeded the permissible limits.

6.4 REPORT ON AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING DURING DEEPAWALI FESTIVAL, 2016



Noise level limits prescribed by CBCB

Category of Area/Zone	Limits in dB (A) Leq	
	Day Time (6.00 am – 10.00 pm)	Night Time (10.00 pm – 6.00 am)
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

*Note: Monitoring values found exceeding the permissible limit are marked red

City : Mapusa
Latitude & Longitude : 15.60 ^{0}N, 73.82 ^{0}E
Climate/Meteorology: Tropical Climate
Population: 40,122 as per 2001 census
Major land use: Urban

Monitoring Location: Mapusa Municipality
Description of monitoring site: Silence
Activities around the monitoring location: Vehicle Movement

Data/Observations:

Noise level during Deepawali festival, 2016:

Location A: Mapusa	Normal Day (25-10-2016)			Deepawali Day (30-10-2016)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr	56.6	90.0	72.0	50.1	98.0	77.3
19:00 to 20:00 Hr	56.2	88.0	66.5	34.1	94.6	70.1
20:00 to 21:00 Hr	50.3	83.5	63.5	47.2	95.1	73.6
21:00 to 22:00 Hr	47.3	81.1	66.3	56.6	81.6	69.5
22:00 to 23:00 Hr	41.9	86.9	67.1	40.9	86.9	64.8
23:00 to 24:00 Hr	47.5	77.5	59.5	50.1	98.0	77.3

Results: On normal day i.e on 25th October 16, considering the day time and night time noise level limits for Silence Zone i.e 60 dB for monitoring conducted between 18:00 to 22:00 Hrs and 50 dB for monitoring conducted between 22:00 to 24:00 Hrs, the noise levels were found to be exceeding the permissible limit due to vehicular movement.

On Deepawali day i.e on 30th October 16, the noise level monitoring exceeds the permissible limit due to bursting of fire crackers and vehicular movement.

City : Panjim
Latitude & Longitude : 15^{0}29'56' N, 73^{0}49'40'E
Climate/Meteorology: Tropical Monsoon Climate
Population: 1,14,405 as per 2011 census
Major land use: Urban

Monitoring Location: Patto-Panjim
Description of monitoring site: Commercial
Activities around the monitoring location: Vehicle Movement

Data/Observations:

Noise level during Deepawali festival, 2016:

Location B : Panjim	Normal Day (24-10-2016)			Deepawali Day (30-10-2016)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr	35.1	93.1	63.3	36.5	82.4	69.5
19:00 to 20:00 Hr	37.6	80.1	56.9	*	*	60.7
20:00 to 21:00 Hr	37.7	72.6	48.6	32.6	82.5	65.7
21:00 to 22:00 Hr	33.8	84.7	59.7	*	*	65.8
22:00 to 23:00 Hr	35.2	70.3	55.7	*	*	65.5
23:00 to 24:00 Hr	33.3	83.7	57.6	*	*	64.8

Results: During normal day monitoring i.e on 24th October, considering day time and night time noise level limit for commercial zone i.e 75 dB for monitoring conducted between 18:00 to 22:00 Hrs and 65 dB for monitoring conducted between 22:00 to 24:00 Hrs, the noise levels were found to be within permissible limits.

Similarly on Deepawali day i.e on 30th October, the noise levels were found to be within permissible limits.
* Data could not be retrieved due to software problem.

City : Vasco
Latitude & Longitude : $15^0$23'53'N, $73^0$48'40'E
Climate/Meteorology: Tropical Climate
Population: -
Major land use: Urban

Monitoring Location: Fuse Call-Office, Vasco
Description of monitoring site: Commercial
Activities around the monitoring location: Vehicle Movement

Data/Observations:

Noise level during Deepawali festival, 2016:

Location C : Vasco	Normal Day (25-10-2016)			Deepawali Day (30-10-2016)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr	30.9	87.4	66.8	36.1	94.5	68.1
19:00 to 20:00 Hr	55.5	81.3	65.8	51.9	93.9	70.9
20:00 to 21:00 Hr	52.3	83.7	66.1	57.4	91.0	72.8
21:00 to 22:00 Hr	49.2	87.1	62.2	55.2	94.7	70.0
22:00 to 23:00 Hr	49.3	88.0	63.2	55.6	86.5	75.1
23:00 to 24:00 Hr	31.4	81.5	61.7	38.9	101.1	77.2

Results: On normal day monitoring i.e on 25th October, considering the day time and night time noise level limit i.e 75 dB for monitoring conducted between 18:00 to 22:00 Hrs and 65 dB for monitoring conducted between 22:00 to 24:00 Hrs, the noise levels were found to be within permissible limits.

On Deepawali day i.e on 30th October, the noise levels from 22:00 to 24:00 Hrs exceeds the permissible limits due to bursting of fire crackers nearby and vehicular movement.

City : Margao
Latitude & Longitude : $15^0$16'25'N, $73^0$57'29'E
Climate/Meteorology: Tropical Monsoon Climate
Population: 1,06,528 as per 2011 census
Major land use: Urban
Monitoring Location: Municipality Garden
Description of Monitoring Site: Commercial
Activities around the monitoring location: Vehicle Movement

Data/Observations:

Noise level during Deepawali festival, 2016:

Location D : Margao	Normal Day (24-10-2016)			Deepawali Day (30-10-2016)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr	41.4	103.0	75.6	31.0	94.9	72.7
19:00 to 20:00 Hr	46.4	102.0	74.0	56.9	84.7	64.9
20:00 to 21:00 Hr	44.7	91.9	73.1	55.3	81.8	64.1
21:00 to 22:00 Hr	44.0	90.7	71.3	53.2	82.2	64.3
22:00 to 23:00 Hr	40.7	78.0	55.8	48.3	77.8	60.1
23:00 to 24:00 Hr	46.0	58.7	47.8	43.1	75.1	57.2

Results: On normal day monitoring i.e on 24th October, considering the day time and night time noise level limits i.e 75 dB for monitoring conducted between 18:00 to 22:00 Hrs and 65 dB for monitoring conducted between 22:00 to 24:00 Hrs, the noise levels were found to be within permissible limit.

Also on Deepawali day i.e on 30th October, the noise levels were found to be within permissible limit.

As per the Noise Pollution (Regulation and Control) rules 2000, A person may, if the noise level exceeds the ambient noise standards by 10 dB(A) or more given in the corresponding columns against any area/zone [or, if there is a violation of any provision of these rules regarding restrictions imposed during night time], make a complaint to the authority.

6.5 PERFORMANCE EVALUATION STUDIES OF EFFLUENT TREATMENT PLANTS OPERATING IN GOA CONDUCTED DURING 2016-17

The Board conducted the performance evaluation study of the following 5 treatment plants.

1. EFFLUENT TREATMENT PLANT – M/S GKB HI TECH LENSES PVT LTD, PLOT NO. 17a, TIVIM INDUSTRIAL ESTATE, KARASWADA, MAPUSA-GOA from 12.10.16 TO 13.10.16 (24hrs)

The following are the observations, summary, conclusions and recommendations:

A. The unit has installed Effluent Treatment Plant of capacity 50 KLD and for which the ETP performance study was conducted to ascertain the quality of treated waste water and its compliance with the consent parameter limits under water Act. Goa State Pollution Control Board has conducted 24 hrs composite sample collection and monitored the effluent treatment plant from 12th October 2016 to 13th October 2016. The said unit operates the effluent treatment plant to treat the waste water generated from hard coating department and surfacing department. The ETP received 27 KLD of waste water during the monitoring period from 12th October 2016 to 13th October 2016.

B. SUMMARY AND CONCLUSIONS:

The Industry has designed an Effluent Treatment Plant to treat 50 KLD, however, only 27 KLD of waste water were generated during monitoring period.

The analysis reports indicate that the final treated effluent is meeting the standards laid down in the consent order.

The waste water generated from the industry is treated in effluent treatment plant designed with Bio-Tower. The alkaline raw effluent collected in Collection tank cum neutralisation tank is neutralised with Hydrochloric acid and then pumped into Primary Settling tank where alum dosing is done. Primary

treated effluent is then pumped into Bio-Tower, where the effluent is passed through Bio film media and finally through sand filter and carbon filter. The treated water is stored in final treated water tank and further it is used for gardening.

Approximately 250 Kg of dry sludge is stored in the unit premises and approximately 300 Kg of wet sludge is present in the sludge drying beds.

The flow meter is installed for treated waste water generated and records are maintained.

Analysis reports of Final effluent collected from 24 hours during operation of plant indicates that the consent parameters comply with the prescribed standard limits.

C. RECOMMENDATIONS:

a. The unit should analyse dry sludge stored in their premises and make a provision for its disposal.

2. SEWAGE TREATMENT PLANT – M/S. R & H SPACES PVT. LTD. (HYATT PLACE) PLOT NO. 169/7, OLD CADASTAL SR. NO. 95, CANDOLIM BARDEZ - GOA – GOA from 16.12.16 to 17.12.16 (24hrs)

The following are the observations, summary, conclusions and recommendations:

A. The unit has commissioned their Sewage Treatment Plant, and for which the STP performance study was conducted to ascertain the quality of treated waste water and its compliance with the consent parameter limits under water Act. Goa State Pollution Control Board has conducted 24 hrs composite sample collection and monitored the sewage treatment plant of capacity 116.0 KLD from 16th December 2016 to 17th December 2016. The said unit has installed and operates the Sewage treatment Plant to treat the waste water generated from kitchen, toilets and bath rooms. The STP received 38.0 KLD of waste water during the monitoring period from 16th December 2016 to 17th December 2016.

B. SUMMARY AND CONCLUSIONS:

a. The hotel has 120 rooms, 1 restaurant with seating capacity of 120 persons and swimming pool of capacity 194 m3.

b. The hotel has designed a Sewage Treatment Plant to treat 116 KLD of waste water, however, only 38 KLD of waste water were generated during monitoring period as the hotel occupancy was 86%.
c. The kitchen waste water via oil & grease trap and the domestic waste water are collected as the raw effluent in Collection tank is pumped in to Aeration Tank I & II for aeration. The aeration overflow is taken into Secondary Clarifier & Tertiary Clarifier for settling & further it is passed through sand filter and carbon filter followed by UV System for disinfection. The treated water is stored in final treated water tank and further it is used for toilet flushing and for green belt development within the hotel premises and gardening (approx. 929 m2).
d. The analysis reports indicate that MLSS, MLVSS & DO in the Aeration Tank are 1200 mg/l, 265 mg/l and 1.3 mg/l respectively.
e. The settleability test shown settled volume of sludge of apprx. 550ml/l, e.i. 55% of sludge in the Aeration tank and calculated SVI was 458ml/g which indicates high amount of untreated sludge present in the Aeration tank.

f. The activated sludge plant was operating at F/M ratio at 0.95 per day.
a. As informed the sludge is disposed through night soil tanker in STP plant at Tonca. From the record available, the quantum of the sludge generated and disposed from 02.12.16 to 14.12.16 was approx. 40 KL.
b. The flow meter is installed for treated waste water generated and records are maintained.
c. Analysis reports of Final effluent collected from 24 hours during operation of plant indicates that the consent parameters comply with the prescribed standard limits. However, high amount of untreated sludge remains in the aeration tank indicates low DO.

C. RECOMMENDATIONS

a. Since in an aeration tank, DO value is low and the settled volume sludge & calculated SVI is in excess, indicates high amount of untreated sludge remains in the Aeration tank. The sludge in the aeration tank needs to be treated by increasing aeration to enhance DO and by maintaining the sludge volume in the aeration tank.

Photographs showing the various stages of STP

Bar Screen Chamber

Clarifier

Pressure Sand Filter, Activated Carbon Filter & UV System

3. EFFLUENT TREATMENT PLANT – HINDUSTAN WASTE TREATMENT PVT.LTD, AT MSW SITE SALIGAO, BARDEZ, NORTH GOA Monitored on 07-12-2016 TO 08-12-2016 (24hrs)

A. SUMMARY AND CONCLUSIONS.

a. The Industry has designed an Effluent Treatment Plant to treat 100 M3/D, however, only 46.4 KLD of waste water were generated during monitoring period.

b. The analysis reports indicate that the final treated effluent is meeting the standards laid down in the consent order.

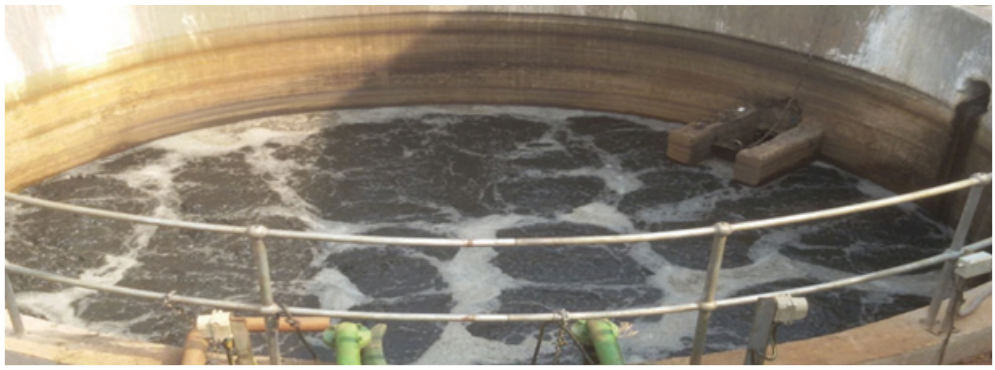
c. The waste water generated from the industry is treated in well designed effluent treatment plant. The raw effluent is collected in equalization tank and waste water is pumped in to pH correction Tank (1) where pH is adjusted by adding Ferric Chloride (Fecl3) polyelectrolyte. The waste water is sent for Sludge Blanket Clarifier (High Rate Solid Contact clarifier). The

overflow from Sludge Blanket Clarifier (HRSCC) is going into pH correction tank by using HCL (if required). Then further it goes in to Membrane Bio Reactor (MBR).The retention time in MBR is 19.50 hrs. From the MBR it is collected in collection tank (Recycle Tank) from collection tank same is further taken for Washing and toilet flushing and gardening within the premises.

d. The analysis reports indicate that MLSS & DO in the Aeration Tank is 4580 mg/l and DO is 4.0 mg/l and it shows that sludge development in aeration tank is achieving the required quantity ie. 3000 mg/l- 6000mg/l., and DO 2.0 to 4.0 mg/l. As per (MBR process) indicating that Aeration is sufficient to develop the MLSS and DO.
e. The activated sludge plant was operating at F/M ratio at 0.6 per day respectively. The standard for F/M ration for MBR treatment system will be 0.1 to 0.18
f. The F/M ratio is high in Effluent treatment plant as per the standard for F/M ratio.
g. The quantum of the sludge generated was not recorded.
h. The Nitrate-Nitrogen parameter indicates that Final Effluent value is greater than Raw effluent.
i. The sludge generated from Sludge Blanket Clarifier. This sludge contains polymer as it is a chemical sludge and sludge generated from MBR is Biological sludge. Both these sludge is collected in collection sump and then it is pumped in the Centrifuge for drying. The sludge after dried is mixed with compost and the same is sent to fertilizer company ie. ZACL.
j. Analysis reports of Final effluent collected from 24 hours during operation of plant indicates that the consent parameters comply with the prescribed standard limits. The F/M ratio is low due to low due to less quantity of waste water generation from the facilities.

RECOMMENDATIONS

a. The flow meters should be installed for influent (inflow) before taking it for treatment.
b. Records should be maintained of the sludge generated and disposed.
c. A mechanism or process for removing scum, grease, and floatables should be provided before the equalization tank.
d. Tree plantation should be continued during monsoon period within the premises in order to develop green belt in the surrounding areas.
e. The ETP plant can be operated /upgraded on full load which is designed for 100 KLD for treatment of waste water generated.
f. The nitrate-Nitrogen value in the final treated effluent is higher than raw effluent although no limits are given in the consent may please be clarify in case the water finds its way in to nearby water bodies.
g. The ETP sludge sample should be analysed in the Environmental approved lab and report should be submitted to Board.
h. The party should ensure continuous operations of ETP plant to maintain the parameters within the stipulated limits as per the consent order issued by the Board.
i. An alarm system for control of non-functioning of ETP units should be installed at the plant.
j. The party should install Online monitoring system to monitor the relevant parameters for ETP as per the consent order issued by GSPCB.
k. An adequate storage should be provided for partially/treated water not meeting the prescribed standard for re-treatment of the waste water.



4. EFFLUENT TREATMENT PLANT – ESTEEM INDUSTRIES PVT. LTD; & VIC INDUSTRIES, PISSURLEM INDUSTRIALESTATE, PISSURLEM, SATTARI - GOA Monitored on 09-12-2016 TO 10-12-2016 (24hrs)

SUMMARY AND CONCLUSIONS

a. The Industry has designed an Effluent Treatment Plant to treat 100 M3/D, however, only 31.5 KLD of waste water were generated during monitoring period.
b. During the day of monitoring the products manufactured and raw materials are collected from the both the industrial units.
c. The analysis reports indicate that the final treated effluent is meeting the standards laid down in the consent order.
d. The Domestic and Industrial waste water generated from the both the industries is treated in well designed effluent treatment plant. The raw effluents generated from both these units are collected in equalization tanks. Before entering the industrial effluent in the equalization tanks. The industrial waste water is pumped in to pre-treatment tanks where coagulant (Dicyan Diamide, Coaglant EQ) and flocculants Polyelectrolyte(Anionic Poly Acrylamide Polymer) are added. The settled watery sludge is passed through a filter press and the sludge generated is transfer in to sludge drying beds. The pre-treated industrial waste water is sent for biological treatment treated alongwith Domestic waste water in to aeration tank. The retention time in Aeration Tank is 3 Days. From the aeration tank overflows is sent in to clarifier from clarifier the overflow is collected in to collection tank from where it is passed in to a sand filter and carbon filter. Then the treated effluent is partly taken for RO plant and partly used for gardening within the premises as informed.
e. The analysis reports indicate that MLSS & DO in the Aeration Tank is 2570 mg/l and DO is 0.0 mg/l and it shows that sludge development in aeration tank is achieving the required quantity ie. 2000-3000 mg/l- 6000mg/l., and DO 2.0 to 3.0 mg/l. As per (ASP process) indicating that Aeration is in-sufficient to develop the DO.
f. The activated sludge process/plant was operating at F/M ratio at 0.42 per day respectively. The standard for F/M ration for ASP treatment system will be 0.25 to 0.30
g. The F/M ratio is slightly on higher side in Effluent treatment plant as per the standard for F/M ratio.
h. The quantum of the sludge generated was not recorded.
i. The sludge generated from pre-treatment tanks. This sludge contains polymer as it is a chemical sludge and sludge generated from ASP is Biological sludge. Both these sludge is collected in collection sludge drying beds. The sludge after dried is storage in poly bags for further disposal to authorised TSDF. The company has obtained membership of Mumbai Waste management Ltd;. Taloja-Mumbai, for disposal of ETP sludge.
j. Analysis reports of Final effluent collected from 24 hours during operation of plant indicates that the consent parameters comply with the prescribed standard limits. However DO fixed at the site was analysed. The analysis report indicates that DO in Aeration tank is Zero. The F/M ratio is high due to less quantity of waste water generation from the facilities.

RECOMMENDATIONS

1. The flow meters should be installed for influent (inflow) before taking it for further treatment.
2. Records should be maintained of the sludge generated and disposed.

1. A mechanism or process for removing scum, grease, and floatables should be provided before the equalization tank.
2. Tree plantation should be continued during monsoon period within the premises in order to develop green belt in the surrounding areas.
3. The ETP plant can be operated /upgraded on full load which is designed for 100 KLD for treatment of waste water generated.
4. The Sulphate value in the final treated effluent is higher although no limits are given in the consent may please be clarified in case the water finds its way in to nearby water bodies.
5. The ETP sludge sample should be analysed in the Environmental approved lab and report should be submitted to Board.

6. The DO level in the Aeration tank is Zero during the performance evaluation. The same may be rectify by checking the aeration time, Blower, air distribution in aeration tanks, chocking of air blow pipes and tubes etc.
7. The party should ensure continuous operations of ETP plant to maintain the parameters within the stipulated limits as per the consent order issued by the Board.
8. An alarm system for control of non-functioning of ETP units should be installed at the plant.
9. The party should install Online monitoring system to monitor the relevant parameters for ETP as per the consent order issued by GSPCB.
10. An adequate storage should be provided for partially/treated water not meeting the prescribed standard for re-treatment of the waste water.
11. The ETP receive 31.5% waste water for treatment of its capacity 100KLD.
12. This being a chemical producing unit and different products are being manufactured the ETP Performance evaluation may be repeated to have the check on the treatment processes at a frequent interval.

5. SEWAGE TREATMENT PLANT – M/S. UMIYA HABITAT, RESIDENTIAL COMPLEX; SANCOALE- GOA Monitored on 16-02-2017 TO 18-02-2017 (24hrs)

SUMMARY AND CONCLUSIONS

a. The M/s. Umiya Habitat a residential complex has designed an Sewage Treatment Plant to treat 150 M3/D, however,90-95 KLD of waste water were generated during monitoring period.
b. The analysis reports indicate that the final treated effluent is meeting the standards laid down in the consent order.
c. The waste water generated from the residential complex is treated in well designed Sewage Treatment plant. The raw/domestic effluent is passed through Bar Screen Chamber and collected in Collection/equalization tank and waste water is pumped in to Aeration Tank/Bioreactor with plastic Media (Sewage Contact time in aeration Tank - 3- 4 hrs). The overflow from the Aeration Tank is collected in to tube settler. And again the overflow from the tube settler is collected in polishing tank further it is taken for Sand Filter and Carbon Filter. The treated water is discharged in open land and partly used for gardening within the premises.
d. The analysis reports indicate that MLSS & DO in the Aeration Tank is 900 mg/l and DO is 2.8 mg/ml. As per (MBBR process) that in Aeration Tank there is no need of F/M ratio, DO and MLSS levels to maintain.
e. The quantum of the sludge generated was not recorded.
f. The Nitrate-Nitrogen parameter indicates that Final Effluent value is lesser than raw effluent.
g. The STP plant is operated at capacity ie.63% of its capacity.
h. The treated water is discharged in open area within premises of residential complex as per the consent condition the treated water should be recycle for toilet flushing at maximum extend and remaining water should be utilised for green belt development within the premises.
i. After treatment the waste water should be sent for toilet flushing but during monitoring period the pneumatic system recycling was under maintenance and same was not working.
j. Analysis reports of Final effluent collected from 24 hours during operation of plant indicates that the consent parameters comply with the prescribed standard limits.

RECOMMENDATIONS

1. The flow meters should be installed for influent (inflow) before taking it for treatment.
2. Records should be maintained of the sludge generated and disposed.
3. A mechanism or process for removing scum, grease, and floatables should be provided before the Collection/equalization tank.
4. Green Belt/Tree plantation should be continued or maintained within the premises.
5. The Nitrate-Nitrogen value in the final treated effluent is greater than raw effluent although no limits are given in the consent may please be ascertained.
6. Party may be ask to maintain and operational of pneumatic system for recycling for toilet flushing.
7. Party may be ask to utilise the treated water should be recycle for toilet flushing at maximum extend and remaining water should be utilised for green belt development within the premises.
8. The party should ensure continuous operations of STP plant to maintain the parameters within the stipulated limits as per the consent order issued by the Board.

CHAPTER 7

ENVIRONMENTAL TRAINING

7.1 TRAINING / WORKSHOPS/ SEMINARS, ETC. ATTENDED BY BOARD OFFICIALS

During the year under report, the officials of the Board attended training programmes / workshops / seminars etc., organized by reputed Institutions. The details of the same are as follows:

Table 7.1: Trainings Programmes / Workshops / Seminars attended by the Board staff during the year

Name & Designation of the Official	Title of the Seminar	Place	Duration
Mr. Sanjeev Joglekar, Enviromental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Nandan Prabhudessai, Jr. Environmental Engineer	Workshop on Vector Borne Diseases	Corporation City of Panaji	20th April 2016
	1/2 day Consultative workshop on star Rating of Mines	Goa State Library, Sanskruti Bhavan	4th June, 2016
	Seminar on the Goa Regulation of land development and building Construction Act, 2008 & The Goa Land Development and Building Construction Regulaions, 2010	Multipurposes Hall, Central Library- Panaji	2nd July,2016
	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	20th October 2016 and 21st October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Keshav Fadke, Jr. Environmental Engineer	Seminar on the Goa Regulation of land development and building Construction Act, 2008 & The Goa Land Development and Building Construction Regulaions, 2010	Multipurposes Hall, Central Library- Panaji	2nd July,2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Abner Rodrigues, Jr. Environmental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Mr. Rohan Nagvekar, Jr. Environmental Engineer	Seminar on the Goa Regulation of land development and building Construction Act, 2008 & The Goa Land Development and Building Construction Regulaions, 2010	Multipurposes Hall, Central Library- Panaji	2nd July,2016
	How to prepare Air Quality Management Plan	Tughlakabad, New Delhi	18th to 29th July, 2016
	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	21st October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Manoj Kudalkar, Jr. Environmental Engineer	Training programme on Data Management, Collection, Collation & Analysis of Environmental Data and Publish of Analyrtical reports to Public Management of soil and ground water contaminated sites	Tughlakabad Institutional Area, New Delhi- 110 062	11th - 15th April, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Amit Shanbag, Jr. Environmental Engineer	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	20th October 2016 and 21st October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Pravin Faldessai, Jr. Environmental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Shri Bento Thomas, Jr. Environmental Engineer	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	20th October 2016 and 21st October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Digvijay Dessai, Jr. Environmental Engineer	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	20th October 2016 and 21st October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Miss Lee Ann Antao, Jr. Environmental Engineer	Training Programme on Two weeks Foundation Course and one week specialization course on Compliance Monitoring and Enforcement	Tughlakabad Institutional Area, New Delhi	1st to 19th February, 2016
	Best Practices in Environmnetal Governance	Delhi, Gothenberg, Sweden	15th to 28th October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Shashank Dessai, Jr. Environmental Engineer	Environmental Management Sytems at Birla Institue of Technology & Science, Pilani	KK Birla Goa Campus	20th October 2016 and 21st October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Nikhil Caeiro, Jr. Environmental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training Programme on Preparing Consent and Inspection Checklist	Centre for science & Environment, 38 Tughlaqabad, New Delhi	9th to 13th January, 2017
Mr. Devesh Gholkar, Jr. Environmental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Vijay Kansekar, Jr. Environmental Engineer	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training Programme on Preparing Consent and Inspection Checklist	Centre for science & Environment, 38 Tughlaqabad, New Delhi	9th to 13th January, 2017
Mr. Sebastiao Barreto, Engineering Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Ashley Pereira, Engineering Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training Programme on E-waste	Institute of Menezes Braganza, Panaji	12th to 14th December, 2016
Mr. Vinson Quadros, Engineering Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Sebastiao Colaco, Engineering Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Liston Fernandes, Engineering Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Mrs. Jenica Sequeria, Scientist 'C'	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	40th Workshop on The Sexual Harassement of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	Hotel Fortune Select JPCosmos, Cunningham Crescent Road, Bengalure	09th & 10th Februrary, 2017
Miss. Connie Fernandes, Scientist 'C'	Workshop on Environmental Management Systems	Birla Institute of of Technology & Science, Sancoale, Vasco	20th & 21st October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training Programme on E-waste	Institute of Menezes Braganza, Panaji	12th to 14th December, 2016
	Workshop on Marine Resources of Goa:Contribution by CSIR NIO	CSIR-Dona Paula	18th and 19th March, 2017
Dr. Mohan Girap, Scientist 'C'	Workshop on Solid Waste Management Act and Rules	Seminar Hall, Secretariat, Porvorim	21st June, 2016
	Workshop on Environmental Management Systems	Birla Institute of of Technology & Science, Sancoale, Vasco	20th & 21st October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Francisca Pereira, Scientist 'B'	Workshop on Environmental Management Systems	Birla Institute of of Technology & Science, Sancoale, Vasco	20th & 21st October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Sanjay Kankonkar, Scientist 'B'	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Nilesh Parsekar, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Anny Dias, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Livia D'Silva, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Mr. Ganpat Naik, Scientific Assistant	Specialization course on Continious emission Monitoring System	Bellary, Karnataka	8th to 12th August, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Joshna Mahale, Scientific Assistant	Training on Envoronmental Water Quality data entry system (E-WQ-DES)- Revised training calendar for enteraction meet cum training at CPCB-Delhi	CPCB-Delhi	25th October 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training Programme on Hands-on-Training on Sophisticated Instruments and GC/GC-MS Operation	Hyderabad	23rd to 25th November, 2016
Ms. Chetna Naik, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Avina Barretto e Pereira, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
	Training programme on Compliance, Monitoring and Enforcement	Centre for Science and Environment, New Delhi	01st to 19th February, 2017
Mr. Chaitanya Salgoankar, Scientific Assistant	Training programme on Data Management, Collection, Collation & Analysis of Environmental Data and Publish of Analyrticak reports to Public	Tughlakabad Institutional Area, New Delhi	11th - 15th April 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Ravi Naik, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Miss. Reshma Vaz, Scientific Assistant	Training programme on Best Practices in Environmental Governance	Delhi, Gothenberg, Sweden	15th to 28th October, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Krishnanath Pednekar, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Miss. Denza Cardozo, Scientific Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Mr. Sajid Inamdar Senior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Waman Chari, Senior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Santosh Haldankar, Senior Laboratory Assistant	Training programme on Data Management, Collection, Collation & Analysis of Environmental Data and Publish of Analyrticak reports to Public	Tughlakabad Institutional Area, New Delhi	11th - 15th April 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Sunny Pirankar, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Miss. Reema Kaulekar, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Sanmesh Borkar, Senior Laboratory Assistant	Training programme on Environmental Regulators	Centre for Science & Environment, 38, Tughlakabad Institutional Area, New Delhi	19th to 30th September, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Nilesh Surlekar, Senior Laboratory Assistant	Training programme on Environmental Regulators	Centre for Science & Environment, 38, Tughlakabad Institutional Area, New Delhi	19th to 30th September, 2016
	Specialization course on Continious emission Monitoring System	Bellary, Karnataka	8th to 12th August, 2016
	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Samir Borkar, Senior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Jocelyn Coelho, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Kamlesh Kaulekar, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Freddy Barbosa, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016

Miss. Felsy Pereira, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Deepak Naik, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Quiteria Fernandes e Pereira, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Johnny Bosco, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Miss. Sheetal Yashvant Laad, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Miss. Wilma D'Costa, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mr. Anthony Miranda, Junior Laboratory Assistant	Training programme on Environmatel Audit	Centre for Science & Environment at Directorate of Art & Culture, Lecture Hall, Panaji	12th & 13th November 2016
Mrs. Natalia Dias, Senior Law Officer	40th Workshop on The Sexual Harassement of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	Hotel Fortune Select JPCosmos, Cunningham Crescent Road, Bengalure	09th & 10th Februrary, 2017

7.2 DEPUTATIONS IN THE BOARD

1. Vide Office order no.1/49/15-PCB/Vol.V/Admn/13002 dated 17/10/2016 of the Goa State Pollution Control Board, Shri Devendra Arlekar, Assistant Accounts Officer on deputation to the Board was extended for a further period from 01/01/2017 for the 4th year.
2. Vide office order no. 34/3/2016/PCE - PWD - ADM (II) / 209 dated 12-12-2016 of the Public Works Department, Shri. Shivanand Salelkar was deputed to the Board as Supertending Engineer
3. Vide office order no. DA/ADMN/10-26/2016-2017/TR-1864/117 dated 02-12-2016 of the Directorate of Accounts Shri. Sulesh Naik was deputed to the Board as Accountant.

7.3 RESIGNATION FROM SERVICE

1. Smt. Sudiksha Dessai, Networking Engineer (Contractual basis), resigned from the Board vide resignation application dated 01/02/2017

2. Shri. Denister Dias, Poen resigned from the Board with effect from 20/02/2017.

CHAPTER 8

LEGAL MATTERS OF THE BOARD

8.1 ACTION TAKEN FOR VIOLATIONS OF THE WATER ACT, THE AIR ACT AND ENVIRONMENT (PROTECTION) ACT

The Board while granting consent to operate under the Water Act and Air Act stipulates specific conditions for compliance by the various industries so a to control the level of pollution. the industrial units has to submit regular monitoring report including the stack analysis reports, water reports etc. for effective implementation of the measures adopted by them. The Board also conducts inspections of the industrial units to monitor the compliance. And wherever non compliance is reported show cause notice, Directions are issued to the concerned units.

Further it is also noted that numerous small scale units are operating without obtaining consent to operate of the as required under the Air Act and the Water Act, in such cases the Board has issued Show Cause notices to all such units to apply for consent to operate.

The Board has issued total number of 822 Show cause notices for operating without Consent to Operate. Further directions are issued for non compliances to pollution control measures to the units which are operating without consent to operate and also operating in violations of consent conditions. The Board has issued directions for closure and suspension of the units to 13 numbers of units which have not complied with the conditions stipulated in the consent order and operating without obtaining consent to operate of the Board.

8.2 LITIGATION PROFILE OF THE GOA STATE POLLUTION CONTROL BOARD

The GSPCB is a party in a number of proceedings filed before various Judicial Forums.

Presently as on date, the GSPCB is a party before the following Judicial Forums;

1. The Supreme Court of India
   (GSPCB is party Respondent in Public Interest and Civil Writ Petitions)
2. The High Court of Bombay at Goa
   (GSPCB is party Respondent in Public Interest Writ Petitions and Criminal and Civil writ petitions))
3. The High Court of Bombay
   (GSPCB is party Respondent in Civil Writ Petitions)
4. The Principal Bench of the National Green Tribunal at New Delhi
   (GSPCB is party Respondent in Original Applications)
5. The Western Zone Bench of the National Green Tribunal at Pune
   (GSPCB is party Respondent in original Applications and Statutory Appeals)
6. The Administrative Tribunal at Panjim
   (GSPCB is party Respondent in Statutory Appeals)
7. The District and Session Court
   (GSPCB is party Respondent in Civil Suits)
8. The Judicial Magistrate First Class
   (GSPCB is the Complainant in Criminal Complaints filed by it under provisions of the Water Act and the Air Act)
9. The Human Rights Commission
   (GSPCB is party Respondent in complaints/applications)
10. The State Information Commission
    (GSPCB is party Respondent in Appeals against the orders passed by the First Appellate Authority)

In terms of the provisions of the Air Act, Appeals against Consents that are granted by the Board under the Air Act and directions issued under section 31(A) of the Air Act are heard before the Administrative Tribunal at Panaji and subsequent appeals against the orders of the Administrative Tribunal are to be heard before the Western Zone Bench of the NGT at Pune. In terms of the provisions of the Water Act, Appeals against Consents that are granted by the Board under the Water Act are heard before the Western Zone Bench of the NGT at Pune. Appeals against orders passed by the NGT are heard before the Supreme Court of India.

The Board at its 106th meeting has decided to adopt the following procedure for appointment and allotment of cases that concern it to Advocates to appear on its behalf before various Courts of Law/ Judicial Forums to defend its interests;

On receipt of a notice for the hearing of a matter from a Court Of Law, the file in question is moved to the ld Senior Advocate of the Board and the Additional Solicitor General of India, Advocate A. N. S. Nadkarni, who then allots the matter to an Advocate (that includes all Advocates that are on the panel of the State Government.) Accordingly an allotment letter is then issued by the Board to the concerned Advocate who then conducts the case on behalf of the Board before the concerned Court of Law.

The Board has also appointed a Legal Retainer, Adv. J.B. Faria who has been entrusted with the responsibility of filing of Criminal complaints on behalf of the Board before various Criminal Courts against offenders for violations of the provisions of the Water and Air Acts. The Boards Legal Retainer also appears on its behalf in matters before the Human Rights Commission.

Total number of cases pending before NGT at Pune-	27
Total number of cases pending before Principle Bench at NGT-	2
Total number of cases pending before High Court of Bombay at Goa-	11
Total number of cases pending before Administrative Tribunal at Panjim-	3
Total number of cases pending before the District and Session Court -	2
Total number of cases pending before the Judicial Magistrate First Class-	12
Total number of cases pending before the Human Rights Commission-	5
Total number of cases pending before the State Information Commission-	1

8.3 CRIMINAL COMPLAINTS / FIR'S FILED BY GOA STATE POLLUTION CONTROL BOARD

Sr. no	Case no.	Name of the Court/ Jurisdiction	Parties involved	Brief Comments of the case/matter
1.	Criminal Case No. 306/OA/ WPCP/2015/C.	In the Court of the Judicial Magistrate First Class, Vasco Da Gama.	Shri. Levinson J. Martins(GSPCB) V/s. M/s. Jimcap Electronics Pvt. Ltd & Ors.	Complaint under sec 200 of CR PC read with sec 49(1)(a) of Water(Prevention & Control of Pollution)Act, 1974 for violating the provisions of sec 24(1)(b) read with sec 43, sec 25 & 26 of Water(Prevention and Control of Pollution) Act read with sec 44 & sec 33(A) read with sec 41(2) of the Said Act(Discharge of effluent in nallah near Industrial Estate).

2.	Criminal Case No. 623/ OA/2015/D	In the Court of the Judicial Magistrate First Class at Mapusa, Bardez-Goa.	The Member Secretary, GSPCB Dempo Towes, Patto Plaza,Panaji-Goa Rep. by Shri. Levinson J. Martins V/s. Mrs. Everilda D'Mello Director of Mrs. Derisa(Mela Rosa) Maina Bati, Arpora, Barez-Goa.	Complaint filed under section 200 CR PC for violating provision of section 25 & 26 of Water (Prevention and Control of Pollution)Act, 1974 read with section 44 & section 33(A) read with sec 41(2) of the said Act & under sec 31(A) read with sec 21(A) of the Air(Prevention and Control of Pollution) Act, 1981(Unit is operating without Consent of the Board).
3.	Criminal Case No. 876/ OA/PCB/ 2015/E	In the Court of Judicial Magistrate First Class "E" Court Margao.	Goa State Pollution Control Board V/s. M/s. Sagar Feeds Food Processing Industries & Ors.	Complaint was filed under section 49 of the Water(Prevention and Control of Pollution) Act, 1974 read with sec 200(A) of CR PC for violating provision of sec 24 of Water Act(ETP discharge)
4.	Criminal Case No. 307/ AO/15/A.	In the Court of the Judicial Magistrate First Class, Vasco Da Gama.	The Member Secretary, (GSPCB) V/s. M/s. Crispy Palace, Represented by its owner Peter Fernandes Plot N. L-12, Opp. Jimcap Electronics, Verna Industrial Estate, Verna- Goa & Ors.	Complaint under sec 200 of CR PC read with sec 49(1)(a) of Water(Prevention & Control of Pollution)Act, 1974 for violating the provisions of sec 24(1)(b) read with sec 43, sec 25 & 26 of Water(Prevention and Control of Pollution) Act read with sec 44 & sec 33(A) read with sec 41(2) of the Said Act(Discharge of effluent in nallah near Industrial Estate).
5.	Criminal case No. 314/ OA/2014/D.	In the Court of the Judicial Magistrate First Class,(C Court) at Panaji.	(GSPCB) Member Secretary, Shri. Levinson J. Martins V/s. Rich Builders R/o/. Santa Cruz, Tiswadi-Goa.	Complaint filed u/s. 49 under Water Act 1974 read with section 200 CR PC and for violating the provision of section 25 & 26 of Water Act(STP was not working , all the waste water seen flowing into drains.).
6.	Criminal Case No. 305/ OA/15/B.	In the Court of the Judicial Magistrate First Class, Vasco Da Gama.	Shri. Levinson J. Martins, The Member Secretary,(GSPCB) V/s. M/s. Indoco Remedies(Plant I), Represented by Ravindra V. Salunker, Responsible Officer of the unit, Plot N. L-14, Verna Industrial Estate, Verna - Goa & Ors.	Complaint under sec 200 of CR PC read with sec 49(1)(a) of Water(Prevention & Control of Pollution)Act, 1974 for violating the provisions of sec 24(1)(b) read with sec 43, sec 25 & 26 of Water(Prevention and Control of Pollution) Act read with sec 44 & sec 33(A) read with sec 41(2) of the Said Act(Discharge of effluent in nallah near Industrial Estate).

7	Criminal Case No. 190/ OA/2015/A	In the Court of the Judicial Magistrate First Class, Vasco Da Gama.	Shri. Levinson J. Martins, The Member Secretary, (GSPCB) V/s. M/s.Umiya Habiat, Represented by its Proprietor Aniruddn Mehta, S/o. Bhanuprasad Mehta, , 102/103, Anand Gawas-I, Airport Road, Vasco Da Gama. & Ors.	Complaint under section 200 of Cr.Pc read with section 49 of Water (Prevention and Control of Pollution)Act, 1974 for violating the provisions of section 25 &26 of Water (Prevention &Control of Pollution)Act, 1974 read with section 41 of the said Act.
8.	Criminal Case No. 181/ OA/2016/A	Judicial magistrate First Class, Mapusa A Court.	Shri. Levinson J. Martins, Member Secretary, GSPCB) V/s. Shri. Sachindra Sardesai & 3 Ors. (Vrudhwan Shalby Hospital & Ors.	Complaint under section 200 of Cr.Pc read with section 49 of Water (Prevention and Control of Pollution)Act, 1974 for violating the provisions of section 25 &26 of Water (Prevention &Control of Pollution)Act, 1974 read with section 41 of the said Act and under section 33(A) read with section 41(2) of the said Act & section 31(A) of Air(Prevention & Control of Pollution)Act, 1981 read with section 37(1) of the said Acts.
9	Cri. Case no. 539/OA/16/E.	Judicial magistrate First Class, Margao.	Shri. Levinson J. Martins, The Member Secretary, Goa State Pollution Control Board V/s. Quality Exports & Ors.	Complaint under section 200 of Cr. Pc read with section 49(1) (a) of Water (Prevention and Control of Pollution)Act, 1974 for violating the provisions of section 24(1) (a) (b) read with section 43 of the said Act, 25 & 26 of Water (Prevention &Control of Pollution)Act, 1974 read with section 44 of the said Act & section 33(A) read with section 41(2) of the said Act & section 45(A) of the said Act.
10	Cri. Case no. 123/OA/16/ Ist Additional Court-I.	Judicial magistrate First Class, Margao	Shri. Levinson J. Martins, The Member Secretary, Goa State Pollution Control Board V/s. Quality Foods & Ors.	Complaint under section 200 of Cr.Pc read with section 49(1) (a) of Water (Prevention and Control of Pollution)Act, 1974 for violating the provisions of section 24(1) (a) (b) read with section 43 of the said Act, 25 & 26 of Water (Prevention &Control of Pollution)Act, 1974 read with section 44 of the said Act & section 53 read with section 41(2) of the said Act .
11	Cri. Case no. 181/OA/2016/B.	Judicial magistrate First Class, Margao.	Shri. Levinson J. Martins, The Member Secretary, Goa State Pollution Control Board V/s. M/s. Sua Industries & Ors.	Complaint under section 200 of Cr.Pc read with section 49(1) (a) of Water (Prevention and Control of Pollution)Act, 1974 & section 43(1) of the Air(Prevention and Control of Pollution)Act, 1981 for violating the provisions of section 24(1) (a) (b) . 25(1) (a) and 26 of Water Act read with section 33(A) & 41(2) of said Act.

12	Cri. Case no. 1497/OA/2016/B	Judicial magistrate First Class, Mapusa	Shri. Levinson J. Martins, The Member Secretary, Goa State Pollution Control Board V/s. M/s. Chandra Cleaners & Ors.	Complaint under section 200 of Cr.Pc read with section 49(1) (a) of Water (Prevention and Control of Pollution)Act, 1974 & section 43(1) of the Air(Prevention and Control of Pollution)Act, 1981 for violating the provisions of section 24(1) (a) (b) . 25(1) (a) and 26 of Water Act read with section 33(A) & 41(2) of said Act.

8.4 COMPLAINT MECHANISM

The Goa State Pollution Control Board receives numerous complaints on varied subject matters. In order to scrutinize and examine all such complaints, a Complaint Committee has been constituted comprising of Scientist "C", Senior Law Officer, Environmental Engineer and Engineer Assistant (Computers). The complaints so received are examined so as to verify whether the grievances alleged by the complainants are within the purview of the Water Act, the Air Act or the Rules notified under the Environmental (Protection) Act.

During the year 2015/2016 the Board has received 543 complaints. Upon examining the said complaints it is noted that certain numbers of complaints does not come within the purview of the Board, hence all such complaints were forwarded to the concerned Departments for initiating appropriate action in the matter with the copy endorsed to the complainant. The minutes of the Complaint Committee meeting are also uploaded on the Board website.

The complaints wherein the grievances were regarding air and water pollution the same were inspected and wherever violations are observed appropriate action have been initiated.

8.5 RIGHT TO INFORMATION ACT, 2005

The Right to information Act, 2005 provides access to all information that is available and existing so as to make the functioning of the organizations transparent and accountable. This is clear from a combined reading of section 3and the definitions of 'information' and 'right to information' under clauses (f) and (j) of section 2 of the Act. If a public authority has any information in the form of data or analysed data, or abstracts, or statistics, an applicant may access such information, subject to the exemptions in section 8 of the Act. But where the information sought is not a part of the record of a public authority, and where such information is not required to be maintained under any law or the rules or regulations of the public authority, the Act does not cast an obligation upon the public authority, to collect or collate such non available information and then furnish it to an applicant. A public authority is also not required to furnish information which require drawing of inferences and/or making of assumptions. It is also not required to provide 'advice' or 'opinion' to an applicant, nor required to obtain and furnish any 'opinion' or 'advice' to an applicant. The reference to 'opinion' or 'advice' 49 in the definition of 'information' in section 2(f) of the Act, only refers to such material available in the records of the public authority. Many public authorities have, as a public relation exercise, provided advice, guidance and opinion to the citizens. But that is purely voluntary and should not be confused with any obligation under the RTI Act.

The Goa State Pollution Control Board has appointed the following Officials as Public Information Officer, Assistant Public Information Officer and the First Appellate Authority as per the Right to Information Act, 2005:-

1)	Chairman	First Appellate Authority
2)	Senior Law Officer	Public Information Officer
3)	Junior Law Officer	Asst. Public Information Officer

During the year 2016-2017 the Board has received 309 applications, which are disposed in time bound manner.

CHAPTER 9

FINANCE AND ACCOUNTS OF THE BOARD

9.1 STATUS OF AUDITING OF ACCOUNTS OF THE BOARD

As per sub – sections 2 & 3 of section 40 of the Water (Prevention and Control of Pollution) Act, 1974, the accounts of the Board are to be audited by an Auditor duly qualified to act as an Auditor of Companies under section 226 of the Companies Act, 1956. The said Auditor is to be appointed by the State Government on the advice of Comptroller & Auditor General of India (CAG).

9.2 INCOME, EXPENDITURE AND FUNDING

The income and expenditure account of the Board for the year ended 31st March, 2017 is as per table below:

	Goa State Pollution COntrol Board 2016-17			**Goa State Pollution COntrol Board 2016-17**	
Particulars	1-Apr-2016 to 31-Mar-2017		**Particulars**	1-Apr-2016 to 31-Mar-2017	
Direct Expenses		**5,41,60,125.00**	**Direct Incomes**		**1,57,30,158.00**
Salaries	*5,41,60,125.00*		*Air Consent Fees*	*46,09,620.00*	
Indirect Expenses		**78,42,699.00**	*Ambient Monitoring Fees*	*1,51,494.00*	
Advertisement & Publicity	*24,36,584.00*		*Bio Medical Fees*	*4,97,836.00*	
Office Expenses	*18,51,387.00*		*NOC Fees*	*8,20,826.00*	
Audit Fees	*62,500.00*		*Other Receipts*	*49,50,024.00*	
Computer Consumables	*4,66,027.00*		*RTI Fees*	*2,318.00*	
Electricity Charges	*5,71,336.00*		*Water Consent Fees*	*46,98,040.00*	
Honorarium	*1,96,200.00*				
Hospitality Expenses	*1,75,377.00*		**Indirect Incomes**		**55,16,087.00**
Laptop Advance	*11,232.00*		*Public Hearing*	*55,16,087.00*	
Lab Advance	*28,059.00*				
Office Advance	*28,079.00*		***Nett Loss***		**4,07,56,579.00**
Postage	*1,66,783.00*				
Printing	*1,10,223.00*				

Publications	*18,055.00*				
Refund of Consent Fees	*1,46,120.00*				
Rent, Rates & Taxes	*95,866.00*				
Stationery	*2,24,389.00*				
Telephone Exp	*5,67,365.00*				
Telephone Exp - MS	*21,278.00*				
Tour Advance	*89,719.00*				
Vehicle Hire Charges	*4,14,711.00*				
Wi-Fi	*69,953.00*				
World Env Day Expenses	*91,456.00*				
Total		**6,20,02,824.00**	**Total**		**6,20,02,824.00**

The details of the funding received by the Board for the year under report is as follows:

Funds	**Amount in Lakhs (2016– 17)**
1. Central Govt. (Partial reimbursement of NWMP & NAMP expenses by CPCB)	79.30
2. State Govt.	-
3. Share of Water Cess from Central Govt.	-
4. Fees (consent, NOC, authorization and analysis charges)	408.45
5. Bank interest	-
6. Public Hearing	55.30
7. Other receipts (including grants of SEP programming & Right to Information)	81.89
Total	545.64

CHAPTER 10

ANY OTHER IMPORTANT MATTERS DEALT WITH BY THE BOARD

10.1 IMPLEMENTATION OF HAZARDOUS AND OTHER WASTE (MANAGEMENT & TRANSBOUNDARY MOVEMENT) RULES, 2016

The Hazardous Waste (Management & Handling) Rules were notified by the Ministry of Environment & Forests in the year 1989 under the provisions of the Environment Protection Act, 1986. Later the Rules were amended in the years 2000, 2003 and 2008 and subsequently, they were modified as the Hazardous and other Wastes (Management &Transboundary Movement) Rules 2016.

The Board grants authorizations to industries generating and handling hazardous wastes. The Goa State Pollution Control Board has identified 1143 (as per XGN records) industrial units generating hazardous waste in Goa upto the period of April 2016. During the year under report, 463 units have been granted authorization (new / renewals) under the Hazardous Waste (Management & Handling) Rules, 2008. The hazardous waste generated in the State of Goa for the year 2015-2016, is as follows: Incinerated waste (Pharmaceutical Waste etc)20172.9 MT, Oil Filters/Empty Tins 868 nos, Landfill Waste is 4143.335 MT, Recycable Waste (Used/Spent Oil etc) is 1897.4 MT, Discarded Empty cans/tins is 42853 nos.

The implementation of Hazardous and other Wastes (Management &Transboundary Movement) Rules, 2016 is dealt with by Mr. Ashley Pereira, Engineering Assistant of the Board.

10.2 IMPLEMENTATION OF BIO-MEDICAL WASTE MANAGEMENT RULES, 2016

For the purpose of implementation of the Bio-Medical Waste Management Rules 2016, Hospitals have been classified as per their bedded capacity.

1.	Category 1: With 500 beds and above	1 No.
2.	Category 2: With 200 beds and above, but less than 500	3 Nos.
3.	Category 3: With 50 beds and above, but less than 200	17 Nos.
4.	Category 4: With beds less than 50 including Clinics & Patho Labs.	431 Nos.
5.	All other institutions generating bio-medical waste (not included above)	7 Nos.

Till 31/03/2016, 459 Health Care Units were granted authorizations under the Bio-Medical Waste Management Rules, 2016. The status of the Bio Medical waste generated by these units during the year is given as Table 6 in Annexure VIII.

There are total three hundred and ninety seven Health Care Facilities (HCF) out of which one hundred and fifty are bedded Hospitals with five thousand five hundred and fifty three beds, one hundred and thirteen are non bedded hospital and sixty three are Veterinary hospitals/ research organizations in the State. All the facilities have been granted authorization. Out of these, one facility have incinerator with air pollution control device, one hundred and seventy five have autoclave for sterilization, one have microwave and three hundred and sixteen have shredders for preliminary disposal of hospital instruments such as syringes, needle etc. The total quantity of bio-medical waste generated per day during the year 2012-13 is 4950.90 Kg out of which the total recyclable treated biomedical waste sold by HCF is 43.40 kg/ day and the total treated bio-medical waste disposed by HCF is 4907.50 kg/ day.

The implementation of Bio-medical Waste (Management & Handling) Rules, 1998 is dealt with

by Mr. Vinson Quadros, Engineering Assistant & Mr. Sebastiao Baretto, Engineering Assistant of the Board.

10.3 NOISE POLLUTION (REGULATION & CONTROL) RULES, 2000

The Board conducts monitoring of noise levels whenever any specific complaints of noise pollution are received and action is taken accordingly. In pursuance of clause (c) of rule 2 of the Noise Pollution Regulation & Control Rules, 2000, the Government of Goa vide Notification No. 2/51/2000 –II D (G) Vol I has designated (1) District Magistrates (2) Director General of Police (3) Deputy Collector and Sub-Divisional Magistrates (4) Superintendent of Police and Sub-Divisional Police Officers as 'authority' for the maintenance of ambient air quality standards in respect of noise under the said rules, with effect from 21.09.2000. In view of this, the Board forwards to the Competent Authority all the reports of Noise Level Monitoring conducted by the Board for necessary action.

10.4 IMPLEMENTATION OF SOLID WASTES MANAGEMENT RULES, 2016

The Board issues authorization to all the Urban Local Bodies under the provisions of Solid Waste Management Rules 2016. The authorizations are issued independently for specific purpose to the Municipal Bodies.

As per the Annual Report for the year 2015-2016 submitted to the Central Pollution Control Board, out of 13 Municipal Councils and 1 Municipal Corporation; Seven Municipal Bodies have installed Garbage Treatment Plants and presently all are in operation and six Municipal Bodies have constructed sanitary landfill sites and presently all are in operation. Two Municipal Councils are in process of installation of Garbage treatment plant. All the Municipal Bodies have complied with the provisions of Municipal Solid Waste (Management & Handling) Rules 2016 in terms of collection, segregation, storage & transportation of the waste.

The implementation of Solid Wastes Management Rules, 2016 is dealt with by Mr. Liston Fernandes, Engineering Assistant of the Board.

10.5 IMPLEMENTATION OF PLASTICS WASTE (MANAGEMENT & HANDLING) RULES, 2011

There are twenty four units involved in manufacture of plastic bags and containers in the State. Of the 24 units 20 units have obtained consent and 04 units have obtained registration under Plastic Waste (Management & Handling) Rules 2011. Two units are not in operation. Annexure IX gives the details on "Implementation of Plastic Waste (Management and Handling) Rules, 2011 in States/UTS".

The Government of Goa through the High Level Task Force (HLTF) constituted to provide directions and implement various measures as announced in the Budget Speech, 2012-13, towards resolving the solid waste management problems affecting the State of Goa has taken a decision to phase out the plastic from domestic use.

Accordingly the Government has decided to strictly implement banning the manufacturing, sale and use of the plastic having thickness less than 50 microns and bags which do not have the name of manufacturer, thickness and registration number printed on them as per the provisions of the Plastic Rules 2010 and Goa Non Biodegradable Garbage (Control) Act, 1996.

A drive for this purpose has already commenced on 22nd April 2013 on the occasion of Earth Day all over Goa including in and around the beaches of Goa.

The implementation of Plastics Waste (Management & Handling) Rules, 2011 is dealt with by Mr. Sebastiao Colaco, Engineering Assistant of the Board.

10.6 IMPLEMENTATION OF BATTERIES (MANAGEMENT AND HANDLING) RULES, 2001

There are 08 units who are involved in manufactures/assembling/pre-conditioners of lead acid battery within the state of Goa. 35 dealers have obtained registration as battery dealers. Most of the Bulk consumers are filing half yearly returns regularly to the Board, while most of the dealers are not filing half yearly returns to this office. Status reports on Batteries Management and handling Rules is under preparation. The details of the returns under the said rules are given in Annexure X.

The implementation of Batteries (Management & Handling) Rules, 2001 is dealt with by Mr. Sebatiao Colaco, Engineering Assistant of the Board.

10.7 IMPLEMENTATION OF E-WASTES (MANAGEMENT) RULES, 2016

The computer market in the State has been increasing due to lot of commercial development and IT related activities. The State is emerging with a large middle class group who are willing to buy PC's. A large chunk of demand is still met by Assemblers who compete primarily on low cost advantage.

PC usage increases with the increase of the income level and education level of people. Majority of obsolete PC's are diverted to the grey markets, wherein the non functional parts are changed and fixed with the new parts in PC's and further sold back to customers and remaining miscellaneous scraps are sold to scrap-dealers and recyclers.

There are no recyclers in the State specially doing recycling for obsolete PC's. Existing E-waste handling practices are not expected to manage future E-waste generation thus formal recycling center is needed for E-waste collection, segregation, dismantling and recycling of the material. There is a lack of awareness in public regarding E-waste handling, treatment and disposal.

Presently, there are six units registered with the Board for collection of E-waste from the State of Goa, which is then sent to the registered recycler for recycling. Also the Board has granted authorizations for one unit for dismantling of E-waste

The implementation of E-Wastes (Management) Rules, 2016 is dealt with by Mr. Ashley Pereira, Engineering Assistant of the Board.

The details of annual returns for the year 2015-2016 is annexed as Annexure VII

10.8 ACHIEVEMENTS

10.8.1 EASE OF DOING BUSINESS

The Goa State Pollution Control Board has introduced the POS (Point of Sale) machine through HDFC Bank, where all credit and debit cards are accepting for receiving payment from parties towards fees etc.

The Board has introduced the payment gateway through HDFC Bank to receive online payment from parties towards fees etc without visiting the office.

The Board has also initiated to make payment online to EPF (Employees Provident Fund) through HDFC & Oriental Bank.

10.8.2 ACHIEVEMENTS MADE BY THE BOARD

Recognition of the Goa State Pollution Control Board under ISO 9001:2015 (Quality Management System) vide certification dated 13.08.2016 and is valid upto 12.08.2019

Recognition of the Goa State Pollution Control Board under BS OHSAS 18001:2007 (Occupational Health and Safety Management System) vide certificstion dated 13.08.2016 and is valid upto 12.08.2019

Recognition of the Goa State Pollution Control Board under ISO 14001:2015 (Environmental Management System) vide certification dated 13.08.2016 and is valid upto 12.08.2019

Recognition of the Goa State Pollution Control Board Laboratory under ISO 17025:2005 (Genral Requirements for Competance of Testing and Calibration Laboratories) vide certification dated 29.09.2016 and is valid upto 21.09.2018

10.8.3 NEW OFFICE BUILDING AT SALIGAO

The State government had allotted Goa State Pollution Control Board land (on lease for a period of 99 years) admeasuring 4803 Sq Mts. bearing Survey no. 115 (Part) at Saligao which was in the possession of Department of Science, Technology and Environment for the construction of Board laboratory cum office building with approval of Council of ministers.

The Goa State Pollution Control Board then entered in to a lease deed with Government of Goa on 9th june 2014.

The Board at its 112th meeting held on 25th March 2014 approved appointment of architectural consultant M/s. Architecture Autonomous for comprehensive architectural services including site development, Interior architecture/Graphic design, Landscape Architecture. Thereafter Board obtained all the requisite permissions from the competent authorities for construction of proposed laboratory cum office building. The tender was floated for Civil and Plumbing Works on 09/12/2014 and re-tendered on 10/07/2015. The Board then issued Letter of Commencement of work/work order to lowest bidder M/s. Kalyani Global Engineering Pvt. Ltd. vide letter no. 1/27/01-PCB/7189 dated 19/11/2015 and the foundation stone for the proposed building at Saligao was laid on 07/01/2016 in the presence of Shri. Laxmimikant Parsekar (Honb'le Chief minister of Goa), Shri. Dilip Parulekar (Hon'ble Tourism Minister) and Shri Siddharth Kunkolienkar (Vice chairman –GSIDC).

The Board has appointed Electrical contractor M/s. Goa Friends Eng. Pvt. Ltd. to carry out electrical works of Board laboratory cum office building. The Board has also appointed M/s. National Construction to carry out Fire fighting Works. Tender for elevator (Lift) and Access control system works have already been floated . Other works such as HVAC, Modular Works, Furniture, Interior and landscaping works are yet to be awarded

The R.C.C structure of the building is completed upto Roof level. At present fabrication work of structural roof, plastering, Flooring and electrical works are under Progress. Tentative date of completion of Board laboratory cum office building is November 2017.

10.9 CELEBRATION OF WORLD ENVIRONMENT DAY

World Environment Day (WED), 5th June, is the United Nations' principal vehicle for encouraging worldwide awareness and action for the environment. It also serves as the 'people's day' for doing

something positive for the environment, galvanizing individual actions into a collective power that generates an positive impact on the planet.

The booming illegal trade in wildlife products is eroding Earth's precious biodiversity, robbing us of our natural heritage and driving whole species to the brink of extinction. The killing and smuggling is also undermining economies and ecoystems, fuelling organized crime, and feeding corruption and insecurity across the globe.

Wildlife crime endangers iconic elephants, rhinos, tigers, gorillas and sea turtles. In 2011, a subspecies of Javan rhino went extinct in Vietnam, while the last western black rhinos vanished from Cameroon the same year. Great apes have disappeared from Gambia, Burkina Faso, Benin and Togo, and other countries could quickly follow. Lesser-known victims include helmeted hornbills and pangolins as well as wild orchids and timbers like Rosewood – flowers and timber are also considered wildlife!

In Goa itself, The Jerdon's Bullfrog, poached for its meat in Goa is listed as Near Threatened while the Indian Bull frog, another victim of large-scale hunting is listed as Vulnerable. The Malabar Gliding Frog, an endemic species of South Asia found in Mhadei Wildlife Sanctuary and the Mollem National Park is listed as a Near Threatened species. Amongst other species found in Goa the Beddome's Leaping frog is listed as Vulnerable while the Jerdon's Narrow mouthed frog is listed as Near Threatened on a global scale.

Huge efforts to counter the illicit trade - including stronger policies, public awareness campaigns and investments in community conservation and law enforcement – are a requirement of the hour. However, many species remain at risk and it will take a dedicated and sustained effort by each and every one of us to help in the recovery process.

How can we do it? More people need to understand the damage this illicit business is doing to our environment, livelihoods, communities and security. We must change our habits and behaviour so that demand for illegal wildlife products falls. More awareness and action pushes governments and international bodies to introduce and enforce tougher laws and combat those still willing to break them.

This year's theme for WED – Go Wild for Life – encourages one to celebrate all those species under threat and take action of your own to help safeguard them for future generations. This can be about animals or plants that are threatened within your local area as well as at the national or global level - many local extinctions will eventually add up to a global extinction! Whoever you are, and wherever you live, show zero-tolerance for the illegal trade in wildlife in word and deed, and make a difference.

So the basic Question arising is, "What can I do to safeguard the life of an endangered species, be it plant, bird , fish or animal?- LIVE THE ANSWER"

The WORLD ENVIRONMENT DAY Programmes were held at the GSPCB Conference Hall and Sanskruti Bhavan, Patto.

The following programmes were held along with CEE (Centre for Environment Education):

On 03rd June 2016, a Staff children painting/Poster competition based on the UNEP theme, titled : "Protect Wild life and trees in my World" was held for all the GSPCB staff children, seeking out the childrens views on how they can contribute to towards protecting wild life and forests through simple practices starting at home. The childrens Poster's were very inspirational. More than 15 children participated in two categories Junior (Jr.)aged 5-11 yrs and Seniors(Srs.) aged 12-16

Childrens Poster Competition

Jr.Cat: 1st : Fraser Nunes

2nd : Kraig A. Menezes

3rd : Chrissie Fernandes

1st Consolation Prize : Merrily F. Gonsalves

2nd Consolation Prize : Shelomi A. Pereira

1st Place : Divesh Dongrikar Prabhudessai

2nd Place : Reboni Araujo

3rd Place : Bhargavi V.

1st Consolation : Varshada Naik

2nd Consolation : Aaliyah J. Gonsalves

1st Place : Ayush S. Naik

2nd Place : Dipen D. Arlekar

3rd Place : Vaibhav Thari

1st Consolation : Aastha Girap

Posters on display

On 03rd June'2016 , a Quiz competition was arranged by the Centre for Environment Education(CEE) involving teams from various private Industries and Government Departments on the following theme: "GO WILD FOR LIFE"- The following teams participated from both Government Departments/GSPCB/ Stakeholders/Industries/ Commercial Units)-.

S. No	Organisation	Names
1	Goa Forest Department -1st PRIZE	Mr. Bipin Phaldessai
		Ms. Shefali Naik
2	Goa State Biodiversity Board-2nd PRIZE	Ms. Reshma Kerkar
		Ms. Varsha Raikar Hoble
3	Central Exise and Service Tax-3rd PRIZE	Mr. Mani Bhushan
		Dr. Raghavendra P
4	Zuari Agro Chemicals Limited	Ms. Liselle Periera
		Ms. Keerthana G S
5	Captain of Ports	Mr. Ram Asave M Gupta
6	Department of Tourism	Mr. Chandrakant Khalap
		Ms. Prajakta Kamat
7	Mormugao Port Trust	Mr. Bunny D'sa
		Mr. Carlos Noronha
8	Shraddha Ispat Pvt. Ltd.	Mr. Vidya Shankar Singh
9	Goa State Urban Development Agency	Ms. Gabriella de Mello
		Mr. Joe D'souza
10	Shirdi Steel Rerollers Pvt. Ltd.	Mr. Prakash Bongarde
11	Department of Urban Development	Ms. Lavina H Naik
		Mr. Rahul R Haldankar
12	Cipla Limited	Ms. Trupti Naik
		Ms. Vrushali Kamat
13	Crompton Greaves Consumer Electricals Limited	Mr. Vijay Kalji
		Mr. A Daniel Alexander
14	Encube Ethicals Pvt. Ltd.	Mr. Aditya Shirodkar
		Mr. Kiran Mangale
15	Vedanta Limited	Mr. Aditya Anchilya
		Mr. Mayank Sharma
17	Fomento Resources	Ms. Rupali Pednekar
		Mr. Satyen Vaiude
16	Pfizer Limited	Mr. Sanjay Kulkarni
		Mr. Amit Hange
18	Merck Limited	Mr. Baburao Prabhu
19	Siemens Limited	Ms. Velina D'souza
		Ms. Jayashree Chodankar

20	SWM Cell, Department of Science and Technology	Mr. Abhinav Apte
		Ms. Apoorva Gadre
21	MRF Limited	Mr. Vishnu A S
		Mr. Datta Prabhu
22	United Breweries Limited	Mr. Shesh Shirodkar
		Mr. Jogendra Biswal
23	Mormugao Municipal Council	Mr. Mahesh Kudalkar
		Ms. Nandita Haldankar
24	Grand Hyatt	Mr. Shantanu Singh
		Mr. Rohit Tanawde
25	Directorate of Art and Culture	Mr. Antonio Ferrao
		Mr. Vishwas Gurav

1st Prize: Goa Forest Department Mr. Bipin Phaldessai & Ms. Shefali Naik

2nd Prize: Goa State Biodiversity Board Ms. Reshma Kerkar & Ms. Varsha Raikar Hoble

3rd Prize: Central Exise and Service Tax . Mr. Mani Bhushan & Dr. Raghavendra P

Shrr Sujeet Dongre –Centre for Environment Education (CEE) opened the proceedings of the WED 2016. Shr. Levinson Martins, the Member Secretary of Goa State Pollution Control Board gave a welcome address, followed by a brief oration by the panelists , who consisted of the following

Shri.Ajai Saxena , IFS, Principal Chief Conservator of Forests (PCCF) & Chief Wild Life Warden (CWLW) who gave the Key Note Address on " Go Wild for Life - Zero Tolerance for ill egal Wildlife Trade". He was followed by Dr.Manoj Borkar, Associate Professor – Carmel College Nuvem who spoke on the " Role of an Academician i n Conservation Education".

Shri.Parag Rangnekar- Member, Goa State Biodiversity Board (GSBB), gave an insightful talk on Go WILD for Life in Goa-A Traveller's Experience

The session was followed by an Open House Discussion.

Welcome Address: Member Secretary-GSPCB

Mr.Sujeet Dongre-CEE

Shri.Ajai Saxena, IFS, PCCF & CWLW) College

Dr.Manoj Borkar, Asso. Professor - Carmel

Shri.Parag Rangnekar- Member, GSBB

Dignatories & Audience

The Board than released the GSPCB Annual Report of 2015-16 at the hands of the the Hon'ble Minister for Environment and Forests, Shri. Rajendra Arlekar

Release of GSPCB Annual Report of 2015-16

The session continued with prize distribution and ended with an Address by the Chief Secretary , Govt. of Goa and Chairman –GSPCB , Shri R.K.Srivastava. Shri. Rajendra Arlekar the Hon' ble Minister for Environment and Forests addressed the gathering.

The Vote of Thanks was given by Shri Amarsen Rane, Director Environment

Shri R.K.Srivastava Chief Secretary, Govt. of Goa and Chairman –GSPCB

Shri. Rajendra Arlekar, Hon' ble Minister for Environment and Forests

Vote of Thanks- Shri Amarsen Rane Director Environment

Audience

Various Fruit saplings were also distributed to participants and staff of the Board.

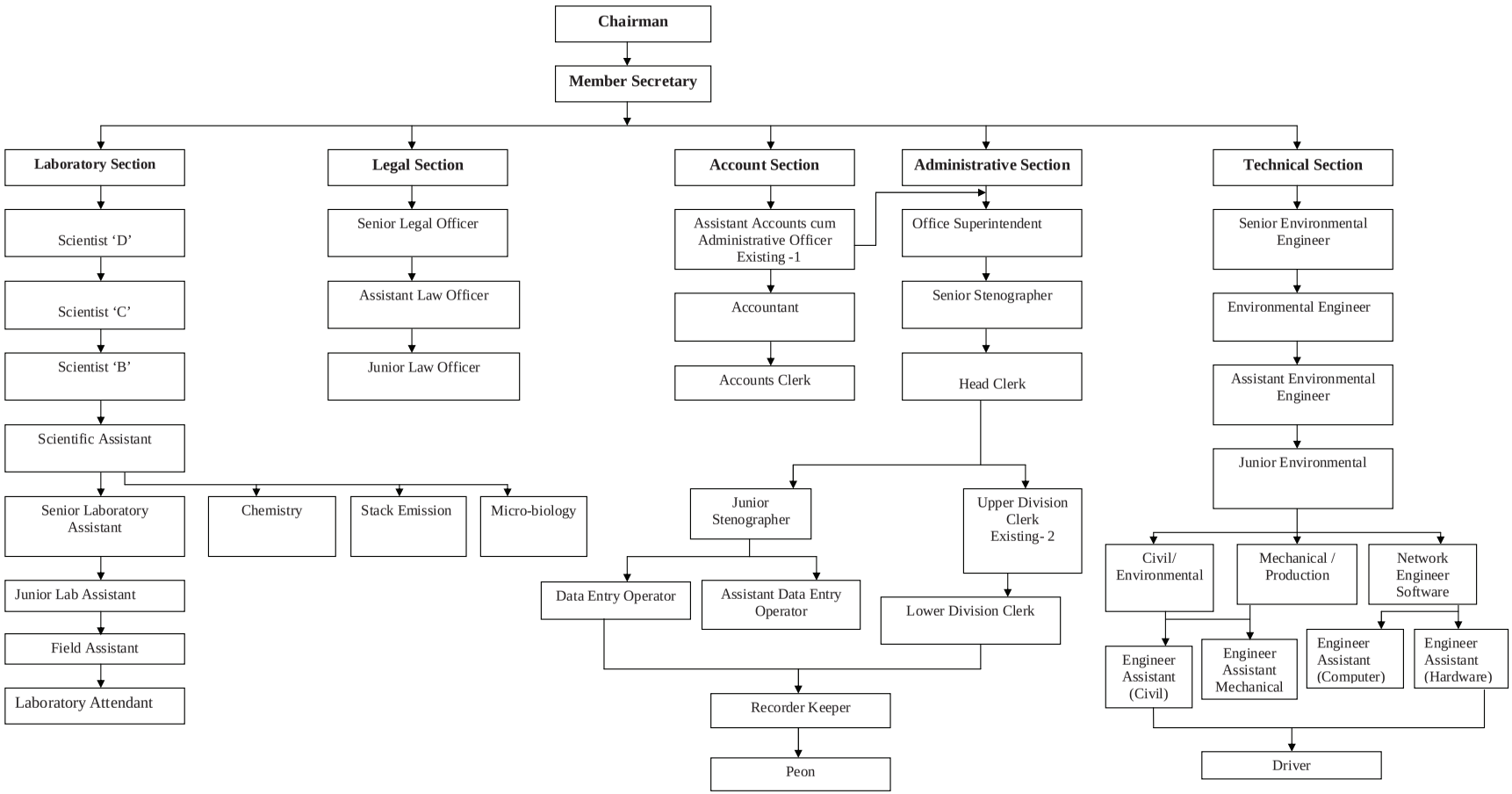
SAVE LIFE , SAVE US!

10.10 IMPLEMENTATION OF THE SUPREME COURT GUIDELINES ON PREVENTION OF SEXUAL HARASSSMENT OF WOMEN AT WORKPLACE

Information in this regard, as per the Supreme Court judgment dated 13/08/1997, is that no complaints about sexual harassment at work place were received by the Board during the financial year covered by this report.

Annexure I

ORGANISATION CHART FOR GOA STATE POLLUTION CONTROL BOARD



ANNEXURE II

LIST OF APPLICATIONS FOR CONSENTS TO OPERATE (CCA) AND CONSENT TO ESATABLISH(CTO) UNDER WATER (PREVENTION & CONTROL OF POLLUTION) ACT, 1974 AND AIR (PREVENTION & CONTROL OF POLLUTION) ACT, 1981 AND HAZARDOUS AND OTHER WASTE (MANAGEMENT & TRANSBOUNDARY MOVEMENT) (AMENDMENT) RULES, 2016 PROCESSED AND APPROVED BY THE BOARD DURING THE YEAR 2016-2017.

Sr.No.	Name of the Industry	Taluka	Granted date
1	Goldfinch Resorts Private Limited	TIS	06-06-2016
2	Tarcar Real Estate Pvt Ltd	TIS	05-01-2017
3	Icecool Car Ac Service	TIS	20-04-2016
4	Rajan Guest House	TIS	27-09-2016
5	Cluck Tales	TIS	20-04-2016
6	Madkaikar Realtors Pvt. Ltd.	TIS	04-08-2016
7	Mslings	TIS	12-09-2016
8	Padmini Infrastructure Developers (India) Ltd	TIS	19-10-2016
9	Alfa Emirados Comercio Geral	TIS	19-10-2016
10	Station Workshop Eme	TIS	18-08-2016
11	Imperium Grand	TIS	14-09-2016
12	Expert Allied Services	TIS	19/10/216
13	Orion Premiere (Hotel)	TIS	01-09-2016
14	Crystal Ice Cubes	TIS	26-09-2016
15	Amina Restaurant	TIS	27-08-2016
16	M\s Sushanti Flour Mill	TIS	27-09-2016
17	Viva Panjim Family Restaurant & Bar	TIS	24-03-2017
18	Alcon Constructions (Goa) Pvt Ltd	TIS	30-01-2016
19	Campal Clinic	TIS	20-10-2016
20	Dr Jayshree's Homoeopathic Health Care Clinic	TIS	17-11-2016
21	Hotel Sea Prince Suites A Beach Resort	TIS	04-04-2017
22	Joseph Marques (Poa Bhushan Savoicar)	TIS	03-02-2017
23	Envirowise Services	TIS	25-04-2017
24	M\s Dilip Buildcon Limited	TIS	06-03-2017
25	M\s Dilip Buildcon Limited	TIS	05-10-2016
26	M\s Sai Service Private Limited	TIS	21-03-2017
27	Shape & Shine Salon & Spa	TIS	17-11-2016
28	Syscon Hospitality Llp	TIS	13-02-2017
29	M\s Old Quarter (Hostel Crowd Hospitality Pvt.Ltd.)	TIS	18-01-2017
30	Cosme Costa's Miramar Hotel	TIS	23-12-2016
31	Sai Service Station Limited	TIS	26-04-2017
32	National Distilleries	TIS	20-04-2017
33	New Bakery Of Chorao	TIS	08-07-2016
34	Hotel Liberty	TIS	15-09-2016
35	J. B. Gracias Salon & Spa	TIS	18-08-2016

36	Menkar Synthetics Llp	TIS	14-07-2016
37	Dona Riva Guest House	TIS	08-07-2016
38	Hotel Methalaka	TIS	08-07-2016
39	Gera Developments Pvt Ltd (Gera Imperium Green)	TIS	07-03-2017
40	Four Seasons Shelters	TIS	29-09-2016
41	M\s Nitin Developers Pvt. Ltd.	TIS	21-12-2016
42	Milroc Good Earth Property & Developers L.L.P (Milroc Kadamba)	TIS	18-10-2016
43	Viva	TIS	25-10-2016
44	Victor Hotels And Motels Ltd (M.V. Horseshoe Casino)	TIS	05-10-2016
45	Attire Hotels & Resorts Pvt Ltd. (Country Inn & Suites)	TIS	15-07-2016
46	Healthway Hospitals Pvt. Ltd.	TIS	24-03-2017
47	M\s Executive Engineer Sd Iii Work Div Iv (Govt. Garage)	TIS	09-08-2016
48	M\s Hotel Shaurya	TIS	06-03-2017
49	goa Mall Cum Hotel	TIS	14-10-2016
50	The Crown Goa - Unit Of Vision Enterprises	TIS	15-09-2016
51	Zillion Enterprises And Homes	TIS	18-08-2016
52	St.Francis Xavier Iron Art	TIS	11-11-2016
53	Sewage Treatment Plant At Edc Complex, Patto	TIS	17-02-2017
54	Paradise Ventures(Paradise-Ii)	TIS	20-03-2017
55	Paradise Ventures(Paradise-I)	TIS	20-03-2017
56	Anuradha Electronics	TIS	19-08-2016
57	A & A Hotels Pvt Ltd	TIS	15-03-2017
58	Buildmore Infrastructure India Pvt Ltd.	TIS	25-07-2016
59	Model Millenium Vistas, Model Real Estate Developers	TIS	19-07-2016
60	Mopa International Airport	PER	07-09-2016
61	Om Ganesh Guest House (H No 698)	PER	05-04-2017
62	Om Ganesh Guest House (Hno - 699(A))	PER	31-03-2017
63	Oasis Guest House	PER	14-10-2016
64	Linc Infra Engineering And Contracts Pvt Ltd	PER	25-10-2016
65	Department of Information Technology (IT Park)	PER	15-07-2016
66	M\s William	PER	25-01-2017
67	M\s Pearl Bakery	PER	01-09-2016
68	La Kood Llp	PER	13-04-2017
69	Centaur Pharmaceuticals Pvt Ltd	PER	11-11-2016
70	M\s Rajendra Kashinath Joshi	PER	29-03-2017
71	M\s Naik Foods (Naguesh Subhash Naik)	PER	23-05-2017
72	Om Ganesh Guest House	PER	05-04-2017
73	M\s Smart Logistics	PER	19-04-2017
74	Esther Cakes And Bakes	PER	22-11-2016
75	M\s Sunny Guest House(Pundalik Naik)	PER	19-04-2017
76	El -Paso Guest House	PER	13-01-2017
77	Shankar Hotel	PER	27-04-2017

78	Five Star Granites	PER	28-04-2017
79	M\s La Cabana Beach & Spa	PER	01-07-2016
80	M\s La Cabana Beach & Spa	PER	01-07-2016
81	M\s Buildmat	PER	14-09-2016
82	Ms Fantasy Spirit Pvt. Ltd.	PER	02-06-2016
83	Himali Soap Products	PER	25-08-2016
84	Power Engineering (India) Pvt Ltd	PER	27-08-2016
85	Selaulim Lake Resort	SAN	30-11-2016
86	100 Mld Water Treatment Of Division Xii Pwd	SAN	29-09-2016
87	M\s Maruskha Stone Industry(Quarry)	SAN	23-11-2016
88	Dementro Metals	SAN	12-09-2016
89	Galaxy Engineering	SAN	09/11/116
90	Y.A.S.N Ventures	SAN	17-02-2017
91	M\s Cosme Brian Julio Fernandes	SAN	16-03-2017
92	Amit Plastics	SAN	23-11-2016
93	M\s Albys Agro Private Limited	SAN	24-03-2017
94	Varun Beverages Limited	SAN	28-11-2016
95	Quality Granite	SAN	12-09-2016
96	Ms Amit Earthmovers	SAN	06-10-2016
97	M\s R. P. Souza & Co.	SAN	29-06-2016
98	Shri Mario P. Mascarenhas	SAN	14-10-2016
99	samrat Industries	SAN	27-04-2017
100	M\s J L Baptista	SAN	20-10-2016
101	Amit Earthmovers	SAN	05-12-2016
102	Kalay Iron Ore Mine, T.C. No. 12\52 & 40\51	SAN	10-03-2016
103	Sociedade De Fomento Ind. Pvt. Ltd., Capxem Iron Ore Transshipment Terminal	SAN	15-12-2016
104	Dattaraj R. S Velingkar (Corpadega Iron Ore Mine)	SAN	09-08-2016
105	Timblo Pvt. Ltd (Magnetic Seperation Plant)	SAN	31-03-2017
106	Sociadade De Fomento Industrial Pvt. Ltd.	SAN	15-12-2016
107	Nomoxitembo De Caurem Mines	SAN	18-05-2017
108	Canacona Hydrocarbons	CAN	25-01-2017
109	Shri Krishna Graphics	CAN	18-10-2016
110	M. V. R. Infra Projects Pvt Ltd	CAN	03-01-2017
111	Sea Gull Guest House	CAN	06-03-2017
112	Zappia - Cove	CAN	06-03-2017
113	Swaksha Automobiles	CAN	27-04-2017
114	Lalaland	CAN	10-04-2017
115	Mopa International Airport	PER	07-09-2016
116	Om Ganesh Guest House (H No 698)	PER	05-04-2017
117	Om Ganesh Guest House (Hno - 699(A))	PER	31-03-2017
118	Oasis Guest House	PER	14-10-2016

119	M\s William	PER	25-01-2017
120	La Kood Llp	PER	13-04-2017
121	M\s Rajendra Kashinath Joshi	PER	29-03-2017
122	Om Ganesh Guest House	PER	05-04-2017
123	M\s Sunny Guest House(Pundalik Naik)	PER	19-04-2017
124	El -Paso Guest House	PER	13-01-2017
125	Shankar Hotel	PER	27-04-2017
126	Chemtrols Industries Ltd	PON	19-08-2016
127	United Breweries Ltd.	PON	29-12-2016
128	Goa State Co-Operative Milk Producers Union Ltd.	PON	02-08-2016
129	Capaxem Barge Loading Jetty	PON	20-10-2016
130	Cadila Healthcare Ltd.	PON	06-02-2017
131	Procter & Gamble Hygiene & Health Care Ltd.	PON	14-10-2016
132	Hindustan Lever Limited	PON	05-12-2016
133	M/s Belladona Plasters Limited	PON	17-03-2017
134	M/s Belladona Plasters Limited	PON	18-11-2016
135	De Nora India Limited	PON	10-03-2017
136	Mrf Ltd.	PON	09-11-2016
137	Chowgule & Company Private Limited	PON	26-04-2017
138	Cgppi Adhesive Products Ltd	PON	08-03-2017
139	Mandovi Casting Pvt Ltd	PON	01-02-2017
140	Merck Limited	PON	08-11-2016
141	Merck Limited	PON	25-10-2016
142	Encube Ethicals Pvt Ltd	PON	30-11-2016
143	Encube Ethicals Pvt Ltd	PON	11-11-2016
144	M\s. Seaward Packaging Limited	PON	18-01-2016
145	Hotel Royal Punjab	PON	18-11-2016
146	Prasad Enterprises	PON	02-08-2016
147	Sri Om Ganesh Packaging	PON	05-07-2016
148	Goldy Finepacks Private Limited	PON	25-04-2017
149	Cartini India Limited	PON	15-07-2016
150	Shree Mahalasa Apartment Guest House	PON	25-08-2016
151	M\s Golden Cashew Products	PON	19-08-2016
152	Pbn Automobiles	PON	27-08-2016
153	Sri Maa Industries	PON	03-11-2016
154	M\s Shubham Plastics	PON	24-03-2017
155	Ms Parvatkar Industries	PON	11-11-2016
156	M\s Shradha Plastics	PON	31-03-2017
157	Sankatmochan Durga Enterprises	PON	16-03-2017
158	M\s Fullarton Distilleries	PON	07-03-2017
159	M\s Meha Chemicals	PON	08-07-2016
160	Phoenix Alcobevz Pvt Ltd	PON	01-02-2017

161	Goa Meat Complex Ltd	PON	02-09-2016
162	United Leadoxide Products Pvt Ltd	PON	02-08-2016
163	Hindustan Foods Ltd.	PON	29-03-2017
164	Vijaya Packaging	PON	24-10-2016
165	M\s Oriental Containers Ltd	PON	11-07-2016
166	Darya Restaurant	PON	04-07-2016
167	Astra Concrete Products (Unit Ii)	PON	10-01-2017
168	Kubera Paints	PON	01-02-2017
169	Shree Shantadurga Saw Mill	PON	21-12-2016
170	Avasas Pack And Print Pvt Ltd	PON	11-07-2016
171	Bhagawati Galvanizing Industries	PON	12-04-2017
172	Abhiman Hotel	PON	08-08-2016
173	Civilco Engineers & Associates	PON	10-03-2017
174	Ilha Verde Refrigeration	PON	02-08-2016
175	Standard Epoxy Materials	PON	29-09-2016
176	Standard Epoxy Materials	PON	07-12-2016
177	Associate Florencio	PON	31-03-2017
178	Technal Engineers	PON	31-01-2017
179	Neha Bakery	PON	10-01-2017
180	Elecon Constructions Pvt Ltd	PON	20-01-2017
181	Konkan Foods	PON	05-02-2017
182	Surya Processing Industry	PON	21-12-2016
183	Sanjivani Industries	PON	21-12-2016
184	Resol Chemicals	PON	27-01-2017
185	Platicare Hospital	PON	18-01-2017
186	The Goa State Agricultural Marketing Board (Grading Machine)	PON	25-11-2016
187	Asm Enterprise	PON	31-01-2017
188	M\s Mallikarjun Bakery	PON	03-04-2017
189	Sai Plastic Associates	PON	16-09-2016
190	Fashion N Style	PON	27-10-2016
191	Naique Food Processing & Packaging	PON	25-10-2016
192	Naique Food Processing & Packaging Unit -II	PON	25-10-2016
193	Suraksha Constructions	PON	03-11-2016
194	Jaiswal Food Products	PON	07-11-2016
195	B. L. Motors	PON	12-10-2016
196	Shri Sai Homeopathic Clinic	PON	11-11-2016
197	M\s Lakshmi Creations-I	PON	31-03-2017
198	Lakshmi Creations -Ii	PON	23-03-2017
199	Nadaf & Sons	PON	27-10-2016
200	Altaf Bakery	PON	25-10-2016
201	Dee Sigdii House	PON	24-11-2016
202	Diptesh Valvaikar (Proposed : Bliss Beverages)	PON	07-11-2016

203	Trimurti Food Industry	PON	08-11-2016
204	Surya Packaging	PON	12-10-2016
205	Sharif & Sons Traders	PON	15-03-2017
206	M\s Matha Engineering Works	PON	11-11-2016
207	M\s Anant Associates	PON	12-10-2016
208	Tulsu Enterprises	PON	14-09-2016
209	R R Industries	PON	15-11-2016
210	Vision Hygiene Systems Pvt. Ltd.	PON	25-08-2016
211	Prasad Enterprises	PON	27-08-2016
212	Fullarton Distilleries Pvt Ltd	PON	28-10-2016
213	Raj Food Industry	PON	27-10-2016
214	Quality Industries	PON	26-09-2016
215	Pradeep G. Arolkar	PON	12-10-2016
216	R. K Trading Co.	PON	07-09-2016
217	Civilco Engineer`s Associates(Golden Sand`s-2)	PON	16-12-2016
218	Industrial Glass Company	PON	26-09-2016
219	Family Care Homeopathic Centre	PON	07-09-2016
220	Ruby Industries Unit - Ii	PON	26-09-2016
221	Prajakta Industries	PON	18-01-2017
222	Gajlaxmi Printers	PON	15-09-2016
223	Vinil Engineering Works	PON	01-07-2016
224	Mahalasa Washing Center	PON	09-11-2016
225	M\s Global Wood Packers Unit Ii	PON	24-10-2016
226	Siddhivinayak Engineering Works	PON	26-05-2016
227	C. K. Industry	PON	08-07-2016
228	Swami Samarth Commercial Laundry	PON	08-06-2016
229	Shivdeep R Kurtarkar & Others	PON	06-03-2017
230	Rajendra G Naik (Quarry)	PON	02-10-2016
231	Aerotec Enterprises	PON	06-07-2016
232	Kayji Real Estate Pvt Ltd. (Kayji Skyline)	PON	25-08-2016
233	Life Care Logistic Pvt. Ltd.	PON	01-03-2017
234	Annapurna Poultry	PON	22-12-2016
235	Samarth Puc Centre	PON	02-07-2016
236	Pearl Engineering Co	PON	02-01-2016
237	City End Bar & Restaurant	PON	11-07-2016
238	Mallikarjun Engg. Works	PON	02-08-2016
239	Goan Paradise (Residencial Cum Commercial Project)	PON	25-04-2017
240	Sapana Ceramics Pvt Ltd	PON	23-11-2016
241	Gopalkrishna Cement Products	PON	02-08-2016
242	Centaur Pharmaceuticals Private Limited	BAR	27-04-2017
243	Golden Peace Hotels & Resorts Pvt Ltd (Hotel Neo Majestic)	BAR	15-04-2016
244	Gkb Hi-Tech Lenses Pvt.Ltd (Plot 50)	BAR	14-10-2016

245	Glenmark Pharmaceuticals Limited (Plant I)	BAR	19-05-2016
246	Glenmark Pharmaceuticals Limited (Plant I)	BAR	27-02-2017
247	Acerock Developers Pvt. Ltd. (The Baga Marina Beach Resorts)	BAR	16-03-2017
248	Crompton Greaves Ltd.	BAR	27-08-2016
249	Goa Glass Fibre Ltd.	BAR	04-05-2016
250	Anant V. Sarmalkar	BAR	20-09-2016
251	Gkb Hi Tech Lenses Pvt Ltd (Plot 17a)	BAR	12-10-2016
252	Tolem De Quela - Keli Iron Ore Mine	BAR	21-12-2016
253	Minco (India) Flow Elements Pvt. Ltd	BAR	29-08-2016
254	M\s. Goa Resorts	BAR	06-12-2016
255	Hotel Bareton	BAR	07-09-2016
256	Hotel Holiday Village	BAR	02-08-2016
257	Counto Automobiles Pvt. Ltd.	BAR	19-08-2016
258	The Tamrind Lodge	BAR	21-04-2017
259	Gkb Optolab Pvt Ltd.	BAR	03-05-2016
260	Sai Service Station Limited	BAR	11-11-2016
261	Navelkar Landmarks	BAR	08-03-2017
262	Navelkar Landmarks	BAR	30-03-2017
263	The Sea Horse Resort	BAR	16-12-2016
264	Centaur Pharmacuticals Pvt. Ltd. (Plant Ii)	BAR	18-08-2016
265	Infiniti Modules Pvt Ltd	BAR	15-09-2016
266	Citrus Hotels.,Silla Goa Hotels Pvt. Ltd.,	BAR	06-02-2017
267	Crompton Greaves Limited., Lt Motor Division : Ind. System	BAR	27-08-2016
268	M\s. Santana Beach Resort,	BAR	06-04-2016
269	Diana Buildwell Limited	BAR	07-12-2016
270	Alor Holiday Resort	BAR	02-08-2016
271	Close 2 C Holiday House	BAR	11-07-2016
272	M\s Shrem Resort Private Limited	BAR	20-10-2016
273	Soham Leisure Ventures Private Ltd	BAR	17-03-2017
274	Soham Leisure Ventures Private Ltd	BAR	30-03-2017
275	J. J Guest House	BAR	03-03-2017
276	Shree Ram Mega Structure Pvt Ltd	BAR	03-05-2017
277	Mayfair Resort (I) Ltd. (La Oasis)	BAR	31-01-2017
278	Ms Sun Leisure India Pvt Ltd 'The Sol'	BAR	06-03-2017
279	NIZMAR RESORT PVT LTD	BAR	09-11-2017
280	M\s Nirvana Nest Buildcon Pvt. Ltd. (Nagoa Grande Hotel)	BAR	26-12-2016
281	M\s Mahindra Holidays & Resorts India Limited	BAR	22-09-2016
282	M\s. Jai Bhuvan Builders Pivate Ltd (Mall De Goa)	BAR	08-01-2016
283	M\s Hotel Dona Terezinha Pvt. Ltd	BAR	11-02-2016
284	M\s Premier Inn	BAR	27-07-2016
285	M\s Concrete Lifestyles (Atlantis)	BAR	04-03-2016

286	Shalini Traders	BAR	11-11-2016
287	M\s Ave Maria Mansion	BAR	11-11-2016
288	Department Of Science, Technology & Environment (Calangutesaligao)	BAR	12-01-2017
289	Casmiro James Vincent Albuquerque (The Grand Leoney Resort)	BAR	06-12-2016
290	Villa De Goa	BAR	02-08-2016
291	Residential Complex Riviera Sapphire	BAR	09-02-2017
292	Hotel Green Park	BAR	09-01-2017
293	Purple Valley Yoga Retreat Centre	BAR	21-03-2017
294	Peter & Friends Classic Adventures Private Limited (CASA TRES AMIGOS)	BAR	17-11-2016
295	Highland Constructions Pvt. Ltd.	BAR	19-10-2016
296	Marina Beach Shack (2016-17)	BAR	30-03-2017
297	P. D. Kamat & Sons (Residential Building)	BAR	16-12-2016
298	Ave Miriam Resort	BAR	11-11-2016
299	Lakhanpal Enterprises Pvt. Ltd. (Aashyana Lakhanpal)	BAR	11-11-2016
300	El Shaddai Charitable Trust	BAR	25-08-2016
301	Akshaya Ayurvedic Pvt. Ltd.	BAR	15-11-2016
302	Vivendas (Mario Fernandes & Co.)	BAR	15-02-2017
303	Sunrise Cashew Industries(Residential Complex)	BAR	30-11-2016
304	Mascarenhas Guest House	BAR	11-11-2016
305	Peter Guest House	BAR	17-10-2016
306	Francisco Fernandes (Guest House)	BAR	29-08-2016
307	Frank Guest House	BAR	29-08-2016
308	Sant Khuris Guest House	BAR	16-11-2016
309	Bamboo Motels And Hotels Pvt Ltd.	BAR	21-03-2016
310	Mosaic Infra Concepts (I) Pvt Ld (Hotel Urbane)	BAR	02-02-2017
311	Gipsy`s Cove Guest House	BAR	18-08-2016
312	Jesat Valley Holiday Homes	BAR	10-03-2017
313	Hotel Cross Road Inn	BAR	29-08-2016
314	Ave Maria Guest House	BAR	02-08-2016
315	William `s Guest House	BAR	25-08-2016
316	Nachiket Hotel Pvt Ltd (Hotel Ashirwad & Bhojan Restaurant)	BAR	19-10-2016
317	M\s Hotel Nova De Goa	BAR	19-10-2016
318	The Milkyway (Gitane Johanna Dsouza)	BAR	06-06-2016
319	Sunrise Ventura Group	BAR	16-03-2017
320	Sub-Zero	BAR	22-11-2016
321	Gumtree Traps Pvt Ltd	BAR	23-11-2016
322	Nil Motors	BAR	26-09-2016
323	Cyprian Fialho (PUC CENTER)	BAR	12-10-2016
324	aurita Holiday Homes	BAR	20-10-2016
325	M\s Sofitel Hospitality And Management Llp	BAR	06-02-2017

326	M\s Lonica Constructions Pvt Ltd	BAR	22-11-2016
327	M\s Lonica Constructions Pvt Ltd	BAR	08-06-2016
328	Goveia Holiday Homes Candolim	BAR	02-08-2016
329	Goveia Resorts	BAR	02-08-2016
330	Goveia Resorts	BAR	02-08-2016
331	Hari Ratna Residency Calangute	BAR	19-08-2016
332	M\s Contec Global(India)private Limited	BAR	21-03-2017
333	Mayfair Resorts India Ltd.	BAR	28-06-2017
334	Sharayu Aura	BAR	19-10-2016
335	Dimar Beach Hotel	BAR	27-10-2016
336	Simran Tekchandani	BAR	30-11-2016
337	Krishna Bar & Restaurant	BAR	08-08-2016
338	M\s Arora Hotels	BAR	18-08-2016
339	Shirodkar Fabrication	BAR	09-06-2016
340	Bashir Fabrication Work	BAR	02-08-2016
341	P4 Builders And Developers	BAR	27-08-2016
342	Coco Heritage Homes (Guest House)	BAR	07-09-2016
343	Goodvalue Hotels & Resorts Pvt Ltd.	BAR	15-11-2016
344	Aarti Management Consultancy Pvt Ltd	BAR	01-08-2016
345	Villa Calangute	BAR	11-11-2016
346	Pirache Art Hotel	BAR	11-11-2016
347	Cafe Liliput	BAR	30-12-2016
348	Saligao Ayurvedic Health Centre Pvt Ltd	BAR	16-08-2016
349	Bhagyanagar Cables Pvt. Ltd.	BAR	18-11-2016
350	St Michael Servicing Center	BAR	25-08-2016
351	Naik Foods	BAR	27-08-2016
352	Fatima Guest House	BAR	17-11-2016
353	Satsanga Retreat Pvt Ltd	BAR	05-07-2016
354	Mr. Jose M. Braganza	BAR	31-03-2017
355	M\s Hira Tiles & Marbles	BAR	08-08-2016
356	The Wash Factory	BAR	21-03-2017
357	Shri Krupa Steel Fabrication	BAR	17-11-2016
358	Mahadev P Agarwadekar	BAR	23-08-2016
359	Shri Chamunda Ceramics	BAR	01-11-2016
360	D'Mello's Apartment	BAR	26-10-2016
361	S. M. Creations	BAR	06-03-2017
362	New Bangore Iyanger Bakery	BAR	23-08-2016
363	M\s Divas	BAR	21-03-2016
364	Dihibiscus Guest House	BAR	21-02-2017
365	Rupesh Engineering Works	BAR	26-09-2016
366	Laxmi Vehicle Pollution Testing Centre	BAR	23-08-2016
367	M\s Gadekar Rice & Flour Mill	BAR	14-09-2016

368	Boa Saude Clinic	BAR	26-08-2016
369	Zac Guest House	BAR	11-11-2016
370	Baba Place Guest House	BAR	06-12-2016
371	Glory Land Restaurant, Dias Villa	BAR	04-01-2017
372	Moye's Navelcar Avenue	BAR	11-11-2016
373	A A Walker	BAR	31-03-2017
374	Martins Siesta	BAR	10-10-2016
375	Agnelo's Holiday Homes	BAR	22-09-2016
376	Evergreen Skin Salon & Wellness	BAR	06-10-2016
377	State Council Of Educational Research And Training	BAR	21-09-2016
378	Weld Tech Engineers	BAR	27-08-2016
379	En Dior Salon And Spa	BAR	27-09-2016
380	Alga Ayurveda And Healing	BAR	13-10-2016
381	Jpl Infrastructure Pvt Ltd (Aalia Villas)	BAR	22-03-2017
382	M\s P. M. Enterprises	BAR	12-09-2016
383	Majestic	BAR	10-03-2017
384	Ecotech Projects Pvt Ltd	BAR	15-02-2017
385	Hotel Calangute Central	BAR	30-11-2016
386	Creamy Creations & Bakery	BAR	22-11-2016
387	Casa Soriano Holiday Homes	BAR	13-01-2017
388	Blue Heaven Ayurvedic Spa	BAR	31-03-2017
389	Galaxy Residency	BAR	17-11-2016
390	Pinto Guest House	BAR	18-01-2017
391	Aura Saloon And Spa	BAR	13-12-2016
392	Gai Kajus Llp	BAR	10-03-2017
393	Magic Hand Saloon & Spa	BAR	10-11-2016
394	Diagrams Realty Llp La-Vida Residency Suites	BAR	06-12-2016
395	Ubon Thai Spa And Saloon	BAR	16-12-2016
396	Chandra Emerald (Chandra Real Estate Developers)	BAR	16-02-2017
397	7seas Spa	BAR	22-12-2016
398	Buddha Bake Delicacies Pvt. Ltd	BAR	13-12-2016
399	Dr. Deepti's Ayurvedic Clinic	BAR	16-12-2016
400	Dynasty Villas And Boutique Resort	BAR	10-03-2017
401	Heritage Princess Real Estate Developers (Residential Project)	BAR	04-01-2017
402	Cohiba (Unit Of Good Life)	BAR	16-02-2017
403	M\s Jai Bholenath	BAR	21-03-2017
404	Shree Sai Agro Processor	BAR	17-01-2017
405	Jayesh Samant (Jetty)	BAR	16-12-2016
406	Awesome Salon & Spa	BAR	23-01-2017
407	Friends Corner (Beach Shack)	BAR	23-01-2017
408	Tervines Shack (Sebastiao Cardoz)	BAR	06-03-2017
409	Pooja Ramesh Sawant	BAR	31-03-2017

410	Cafe Oceanic (Harichandra Parulekar)	BAR	06-03-2017
411	Blush Beauty Parlour (Ladies Only)	BAR	06-03-2017
412	Planet Goa Beach Shack (2017)	BAR	23-01-2017
413	Alex Beach Shack (2017)	BAR	06-03-2017
414	Cheers Beach Shack (2017)	BAR	23-01-2017
415	Sea Escape Beach Shack (2017)	BAR	23-01-2017
416	Rose Roy Beach Shack (2017)	BAR	23-01-2017
417	Moon Light Shack (2017 Cruz Fernandes)	BAR	30-03-2017
418	Appi Shack (2017)	BAR	06-03-2017
419	Blue Coconut Beach Shack(2016-2017)	BAR	06-03-2017
420	Cafe Goa Beach Shack (2017)	BAR	06-03-2017
421	Cafe Horizon (Beach Shack 2016)	BAR	06-03-2017
422	M\s Sky High Beach Shack(2016-2017)	BAR	20-03-2017
423	M\s Bakery	BAR	10-03-2017
424	Residential Building (Amit G Kamat)	BAR	03-02-2017
425	Maria Bakery	BAR	30-03-2017
426	Claramount Avenue	BAR	31-03-2017
427	Goan Waves Beach Shack (2016)	BAR	30-03-2017
428	Monicos Shack (2017)	BAR	30-03-2017
429	Agusta's Shack (Agusta D'Mello 2016)	BAR	30-03-2017
430	M\s Food Express	BAR	08-03-2017
431	Claudina's Shack	BAR	30-03-2017
432	Lucky Star	BAR	30-03-2017
433	Ms Ventura Hospitality and Tourism Pvt Ltd (Hotel Calangute Towers)	MOR	30-11-2016
434	M\s Vassantram Metha And Company Private Limited	MOR	29-12-2016
435	Lafarge Aggregates & Concrete India Pvt. Ltd.	MOR	06-03-2017
436	M/s Astra Metal Systems Private Limited	MOR	25-08-2016
437	Arish Bakery	MOR	29-11-2016
438	Hira Film Exhibitors	MOR	07-03-2017
439	Saritas Guest House	MOR	05-01-2017
440	Vithal. Sharveni	MOR	19-08-2016
441	Unique Equipments	MOR	02-08-2016
442	Ganesh Benzoplast Limited	MOR	15-03-2017
443	Hotel Manish	MOR	12-04-2017
444	Naval Armament Depot	MOR	20-12-2016
445	Imc Limited	MOR	15-03-2017
446	M\s Base Workshop (Goa)	MOR	25-08-2016
447	M\s Air Engineering Workshop	MOR	06-03-2017
448	M\s Hotel La Paz Gardens Pvt Ltd	MOR	12-10-2016
449	M\s Adani Mormugoa Port Terminal Pvt Ltd	MOR	02-05-2016
450	Suresh B. Naik	MOR	25-08-2016

451	Plastchem Industries	MOR	03-10-2016
452	The Honeymooners Houstel	MOR	15-03-2017
453	Hotel Avisha Residency	MOR	06-03-2017
454	Vasco Da Gama Distilleries	MOR	14-03-2017
455	M\s Alaska Bottling	MOR	24-11-2016
456	Hotel Dewa Goa	MOR	07-03-2017
457	Hussain Scrap Traders	MOR	27-03-2017
458	M\s Kusum Pollution Testing Center	MOR	28-09-2016
459	Kedar Agencies	MOR	06-03-2017
460	Costa Pinto & Associates	MOR	13-12-2016
461	Tyre Point	MOR	06-07-2016
462	Kamat Cranes & Co	MOR	06-12-2016
463	Viva Esperanca Ice Plant	MOR	10-06-2016
464	Gammon India Limited	MOR	20-09-2016
465	M\s Trinitas Realtors India Ltd,Llp	MOR	29-08-2016
466	M\s Canara Cold Storage	MOR	06-12-2016
467	Mohidin`s Iconia	MOR	21-09-2016
468	Zuari Global Limited	MOR	29-06-2016
469	M\s Paresh G Phadte (Mobile Screening Plant)	DHA	17-02-2017
470	Sukraft Recycling Pvt. Ltd.	DHA	09-05-2017
471	Roshan Guest House	DHA	04-04-2017
472	Desai Earthmovers (Screening Plant)	DHA	03-01-2017
473	M\s Bhaskar Metals	DHA	19-07-2016
474	Odmola Iron Ore Mine	DHA	23-12-2016
475	Devachi Raim Iron Ore Mine	DHA	23-12-2016
476	Toffee Doodle Foodworks	SAL	30-01-2017
477	Isiandish Beach Shack (2017)	SAL	27-04-2017
478	The Venue (Filipe Neri Da Piedade Correia)	SAL	10-04-2017
479	Mike's Cafe Oasis (2017)	SAL	27-04-2017
480	Meera Motels	SAL	10-04-2017
481	The Sea Ways Beach Shack	SAL	27-04-2017
482	M\s A1 Fence Goa	SAL	12-05-2017
483	Centro Hotel (Sachin G. Pai)	SAL	29-09-2016
484	Karnataka Antibiotics And Pharmaceuticals Ltd	SAL	28-10-2016
485	H.O.E Wellness Pvt Ltd	SAL	30-01-2017
486	Tyre Tech	SAL	22-07-2016
487	Klassic Labels & Barcode Technologies	SAL	10-11-2016
488	Good Shepherd Residency	SAL	21-12-2016
489	Hotel Good Shepherd	SAL	06-12-2016
490	Ashirwad Urology & Laparoscopy Hospital	SAL	24-03-2017
491	Prakash Corrugated Products	SAL	07-12-2016
492	Swagat Lodging & Boarding	SAL	15-09-2016

493	Ng Projects Limited	SAL	10-11-2016
494	Saaj Traders	SAL	12-12-2016
495	Mascarenhas Fabrication And Welding	SAL	20-10-2016
496	Saldanha Rosa Villas	SAL	18-11-2016
497	M\s Shivganga Engineering Works	SAL	22-06-2016
498	Vision Safety India	SAL	07-11-2016
499	Gracias Maternity Hospital	SAL	14-09-2016
500	Vidi Puc Centre	SAL	11-07-2016
501	Super Packaging	SAL	25-08-2016
502	Jolrich Bakery	SAL	19-08-2016
503	The Goan Courtyard Hotel	SAL	16-08-2016
504	Saaras Residency	SAL	06-03-2017
505	M\s Kudos	SAL	06-03-2017
506	Hotel Red Roof	SAL	21-12-2016
507	The Axis Unit I	SAL	27-09-2016
508	The Axis Unit Ii	SAL	22-03-2017
509	Maz Cement Works	QUE	02-09-2016
510	M\s Jayashree Mallikarjun Construction	QUE	25-02-2016
511	Kncept Agro	QUE	30-09-2016
512	Fia's Garden	QUE	22-11-2016
513	Prasad Rama Naik Dessai	QUE	17-05-2017
514	Superlon - Salon And Spa	QUE	20-09-2016
515	Meera Flour Mill	QUE	27-08-2016
516	Pralson`s Agritech Pvt Ltd	QUE	15-02-2017
517	Aqua Viva La Goa	QUE	10-02-2017
518	Family Restaurant	QUE	09-03-2017
519	Geekay Industries	QUE	02-08-2016
520	M\s Kanta Rama Kuncolienkar	QUE	23-09-2015
521	M\s Agencia Commercial Maritima	QUE	03-06-2015
522	Mallikarjun Industries	QUE	29-03-2017
523	M\s Elegant Flooring & Concrete Products	QUE	24-02-2017
524	Furtado (Ssi Unit)	QUE	05-12-2016
525	M\s Precitek Engineers	QUE	04-04-2017
526	Khamamol Jetty, Sesa Resources Limited	QUE	24-02-2017
527	Best Western Peace Valley	QUE	17-08-2016
528	Timblo Drydocks Pvt. Ltd.	QUE	05-12-2016
529	Chowgule & Company Private Limited	QUE	13-10-2015
530	M\s Goodearth Waste Management Enterprises Pvt Ltd	QUE	17-08-2016
531	G.N. Agrawal, Borchi Mordi Maina Iron Ore Mine	QUE	07-09-2015
532	Shri. Jairam B. Neogui, Tembeachem Dongor Iron & Manganese Ore Mine	QUE	31-03-2017
533	Rocktech Engineers (Dry Screening Plant)	BIC	28-12-2016

534	M\s Darshan D Ogale	BIC	29-12-2016
535	Y A S N Ventures	BIC	12-11-2016
536	M\s Priya Cashew Industry	BIC	04-01-2017
537	Mavli Fabrication	BIC	23-01-2017
538	White Rock Bar & Restaurant	BIC	08-11-2016
539	M\s M.M Engineering	BIC	05-01-2017
540	Neelam Bakery	BIC	24-10-2016
541	Salora Packaged Drinking Water	BIC	27-08-2016
542	S. R. L. Enterprises	BIC	02-09-2016
543	M\s Mauli Packaging Enterprises	BIC	04-08-2016
544	Om Sai Enterprises	BIC	13-12-2016
545	Amit Earthmovers	BIC	02-08-2016
546	Noda Foods	BIC	27-10-2016
547	M\s Sachin's Precision Metal Work	BIC	27-10-2016
548	Devi Enterprises	BIC	16-02-2016
549	Gaurish Govekar (Momentz Open air garden venue)	BIC	04-10-2016
550	Sai Service Pvt Ltd	BIC	20-12-2016
551	Prime Paper Products	BIC	07-11-2016
552	Pawar's Cement Block Industry	BIC	05-01-2017
553	Vedanta Limited (BF And SP)	BIC	13-05-2016
554	Fit Agro India Pvt Ltd	BIC	11-11-2016
555	Pyro Electric Cables & Sensors	BIC	02-08-2016
556	M\s Kamat Metal Industries	BIC	18-08-2016
557	M\s Surekha Plastic Moulds	BIC	25-08-2016
558	M\s Ambika Distilleries	BIC	24-08-2016
559	Dhanulaxmi Cashewnuts	BIC	26-04-2017
560	M\s Shaheena Plastics	BIC	13-12-2016
561	Counto Metals & Mining Co. Ltd.	BIC	28-07-2016
562	Desai Earthmovers	BIC	06-10-2016
563	Pradeep V Kamat, Prop M\s Praka Engineering	BIC	18-10-2016
564	Indian Plastics	BIC	15-09-2016
565	Mohit Ispat Ltd	BIC	15-07-2016
566	Pernod Ricard India Private Ltd	BIC	27-08-2016
567	Vedanta Ltd. (Amona Barge Loading Jetty)	BIC	30-12-2016
568	Sociadade De Fomento Industrial Pvt. Ltd.	BIC	12-01-2017
569	D.B.Bandodkar And Sons Pvt.Ltd (Tixem Barge Loading Platform\facilities)	BIC	20-10-2016
570	Pale Plot For Stacking\stocking Of Iron Ore, Pale Mines Of Chowgule & Co. P.Ltd	BIC	11-02-2016
571	Sinquerim Plot For Stacking\stocking Of Iron Ore, Sirigao Mines, Chowgule & Co.	BIC	27-07-2016
572	Sociadade De Fomento Industrial Pvt. Ltd.	BIC	12-01-2017
573	Purmar-E-Parvedat-Pale Iron Ore Mine	BIC	21-12-2016

574	Surla Jetty	BIC	30-12-2016
575	Sinori Jetty	BIC	30-12-2016
576	Alcon Cement Company Pvt. Ltd.	BIC	08-08-2016
577	Maina Barge Loading Jetty	BIC	21-12-2016
578	Rajaram Bandekar (Sirigao) Mines Pvt Ltd	BIC	05-07-2016
579	Dempo Mining Corporation Pvt. Ltd, Barge Loading Jetty At Sarmanus	BIC	17-02-2017
580	Nestle India Limited	BIC	26-09-2016
581	Amona Shipyard Pvt. Ltd. (Ore Loading Facility)	BIC	20-02-2017
582	M/s Vedanta Limited – (Pig Iron Division)	BIC	20-02-2017
583	M/s Vedanta Limited – (Pig Iron Division)	BIC	14-12-2016
584	Chowgule & Company Private Limited (Khazan Jetty)	BIC	23-12-2016

ANNEXURE III

NWMP DATA FOR THE YEAR 2016-2017

RIVER CHAPORA NEAR ALORNA FORT, PERNEM 2016-2017													
Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.36	7.1	7.61	6.9	6.93	6.87	6.78	6.85	7.08	6.73	6.41	7.27	6-9
2	Temperature ˚C	29	31	30.7	28.6	28	28	29	29	28	28	29	29	-
3	Conductivity µs/cm	56.41	47.9	53.8	68.59	66.5	56.42	66.21	59.42	291.8	4.77	2060	4782	-
4	Dissolved Oxygen mg/l	7.2	8	6.9	7	7.3	7.3	7.4	7.6	7.45	6.9	7.2	6	4 mg/l or more
5	Turbidity (NTU)	4.23	1.44	1.23	13.59	3.92	116	112	1.8	2.76	1.66	3.31	2.94	-
6	Nitrite Nitrogen mg/l	0.002	0.001	0.002	0.004	0.002	0.01	0.005	0.002	0.001	0.005	0.013	0.03	-
7	Nitrogen(Nitrate) mg/l	0.07	0.057	0.02	0.33	0.02	0.25	0.12	0.13	0.185	0.15	0.18	0.2	-
8	Phosphate mg/l	0.001	0.082	0.002	0.01	0.006	0.02	0.03	0.003	0.006	0.004	0.02	BDL	
9	BOD mg/l	1.7	1.7	2	0.5	0.7	0.8	1	1.2	0.65	1.3	2.1	0.4	3 mg/l or less
10	COD mg/l	5	5	8	8	2	6	3	8	15	10	14	-	
11	Chloride mg/l	300	3.4	7	6.31	4.37	5.34	5.87	5.2	68	10.2	495	2374	
12	Fecal Coliform MPN/100 ml	1700	2300	1300	1700	2300	4900	2300	1300	1300	780	1300	1300	
13	Total Coliform MPN/100 ml	3300	4900	2300	3300	3300	9400	4900	2200	2200	1100	2400	2200	5000 or less MPN/100 ml
14	Ammonia mg/l	0.008	0.046	0.02	0.06	0.08	0.07	0.05	0.008	BDL	0.01	0.18	BDL	
15	Total Dissolved Solids(mg/l)	80	39	34	46	53	43	40	39	210	2656	1200	2971	
16	Total Fixed Solids (mg/l)	50	4	22	15	17	27	23	29	186	1003	712	-	
17	Total Suspended Solid (mg/l)	7	1	5	5	4	75	66	78	4	49	49	73	
18	Hardness(mg/l)	600	20	20	26	24	24	26	24	44	28	2000	1400	
19	Fluoride(mg/l)	0.076	0.185	0.23	0.2	0.02	0.07	BDL	0.08	0.04	0.09	0.07	BDL	

20	Boron(mg/l)	0.71	0.009	0.49	0.01	0.09	0.8	4.22	-	-	2.99	-	-	
21	Sulphate (mg/l)	17.3	2.82	7.41	4.09	1.77	8.4	1.54	7.7	23.7	6.04	68	314.5	
22	Total Alkalinity(mg/l)	15	24	8	10	34	26	26	52	36	44	54	50	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	34.8	6.3	2	5.3	6.2	4.5	8.6	1.5	49.1	292.2	264.3	551	
25	Potassium(mg/l)	5.5	4.5	1	2.6	2	1.5	0.9	2.9	3.5	18.8	13.9	28.4	
26	Calcium as CaCO3(mg/l)	200	14	12	16	10	14	14	14	22	16	800	600	
27	Magnesium(mg/l)	97.2	1.46	1.94	2.43	3.4	1.46	2.92	2.4	5.35	2.9	292	194	

RIVER KALNA AT CHANDEL, PERNEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.73	6.73	7.11	6.8	7.54	6.88	6.98	6.75	7	6.17	6.25	6.77	6-9
2	Temperature ˚C	28	29.5	30.5	28.7	27.3	27	28	29	28	28	28	28	
3	Conductivity µs/cm	22.71	50.26	67.09	50.39	58.72	56.89	64.29	62.29	8382	93.24	82.02	64.7	
4	Dissolved Oxygen mg/l	5.7	6.5	5.8	7	7.4	7.5	7.6	8.3	8.08	6.4	7.4	7.6	4 mg/l or more
5	Turbidity (NTU)	1.57	2.74	1.95	6.35	17.45	96.7	98.7	1.59	1.48	2.07	2.33	1.77	
6	Nitrite Nitrogen mg/l	0.003	0.007	0.002	0.003	0.006	0.01	0.002	0.002	0.002	0.004	0.002	0.002	
7	Nitrogen(Nitrate) mg/l	0.03	0.111	0.02	0.16	0.26	0.17	0.01	0.011	0.06	0.01	0.01	0.01	
8	Phosphate mg/l	0.02	0.026	0.008	0.004	0.004	0.01	BDL	0.002	0.035	0.003	0.005	0.002	
9	BOD mg/l	0.8	2	2.4	1.9	1	0.6	0.9	1.4	1.48	1	1.8	3	3 mg/l or less
10	COD mg/l	5	5	2	2	17	6	3	5	4	8	8	7	
11	Chloride mg/l	6.5	3.4	11.0	4.86	4.89	4.86	3.91	5.4	7	10.68	10	7.5	
12	Fecal Coliform MPN/100 ml	780	450	4900	2300	1700	3300	780	1300	3300	1300	780	450	
13	Total Coliform MPN/100 ml	1300	780	7000	3300	4600	7900	1300	2300	4900	1700	1300	780	5000 or less MPN/100 ml
14	Ammonia mg/l	0.001	0.148	5	0.08	0.01	0.36	0.02	0.006	0.06	0.01	0.15	BDL	

15	Total Dissolved Solids(mg/l)	55	46	39	39	41	39	41	52	54	58	347	119	
16	Total Fixed Solids (mg/l)	45	5	25	9	21	26	20	24	26	33	118	-	
17	Total Suspended Solid (mg/l)	5	1	5	3	24	93	56	72	10	53	83	84	
18	Hardness(mg/l)	54	26	20	20	18	20	22	28	40	32	28	24	
19	Fluoride(mg/l)	0.016	0.149	0.1	0.3	1	0.06	BDL	0.05	BDL	0.13	0.39	BDL	
20	Boron(mg/l)	BDL	BDL	1.26	0.06	BDL	BDL	2.17	-	-	1.22	-	-	
21	Sulphate (mg/l)	2.91	4.03	4.22	1.16	1.61	5.07	2.21	7.4	1.26	5.26	3.8	2.8	
22	Total Alkalinity(mg/l)	21	30	10	6	22	30	26	48	26	40	32	40	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	8.8	6.4	47	4.6	4.5	3	7	5.2	11.8	4.3	6.3	5.7	
25	Potassium(mg/l)	4.2	4.4	3.5	2.5	2.1	1.1	0.5	3	3.3	0.6	0.9	1.7	
26	Calcium as CaCO3(mg/l)	10	14	12	8	8	14	10	18	16	18	16	14	
27	Magnesium(mg/l)	10.7	2.92	1.94	2.92	2.43	1.46	2.92	2.4	5.83	3.4	2.9	2.4	

RIVER MAPUSA ON CULVERT ON HIGHWAY MAPUSA-PANAJI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	6.93	6.86	7.29	6.8	6.81	6.97	6.87	6.72	7.1	6.68	7.14	7.26	6.5 - 8.5
2	Temperature ˚C	32	32	31	28.9	28.1	30	30	30	29	27	29	30	
3	Conductivity ms/cm	15730	25900	23590	110.5	87.32	403.38	203.370	312.32	4260	15790	16380	14020	
4	Dissolved Oxygen mg/l	6.8	3.5	3.2	5.1	5.1	4.2	5.2	6.6	8.55	5.6	3.8	7	4 mg/l or more
5	Turbidity (NTU)	1.77	0.98	2.01	13.71	29.5	5.07	5.01	2.44	1.41	0.9	1.87	1.88	30 NTU
6	Nitrite Nitrogen mg/l	0.005	0.011	0.016	0.045	0.036	0.01	0.01	0.01	0.003	0.005	0.01	0.004	
7	Nitrogen(Nitrate) mg/l	0.12	0.249	0.14	0.29	0.21	0.56	0.05	0.08	0.111	0.07	0.09	0.12	
8	Phosphate mg/l	0.03	0.043	0.069	0.05	0.05	0.02	0.04	0.02	0.006	0.01	0.02	0.007	
9	BOD mg/l	2.2	1.5	2.1	1.7	2	1.3	1.8	1.8	1.85	1.5	1.5	2.8	3 mg/l or less

10	COD mg/l	-	-	12	12	19	3	6	4	11	9	-	-	
11	Chloride mg/l	5621	5002.3	6506	15.06	5.87	82	59.68	90	1209	60.22	6123	5373	
12	Fecal Coliform MPN/100 ml	3300	3300	2300	2300	2300	2300	1300	4900	3300	4900	7900	2200	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	4900	7000	3300	4900	4900	4900	2300	7900	4900	7900	11000	2700	
14	Ammonia mg/l	0.014	0.236	0.44	0.2	0.24	0.02	0.07	0.06	0.01	0.04	0.15	BDL	
15	Total Dissolved Solids(mg/l)	9984	11374	12494	113	58	282	133	158	2388	8826	2910	9834	
16	Total Fixed Solids (mg/l)	5554	0	10623	49	30	165	80	97	1572	4569	1858	-	
17	Total Suspended Solid (mg/l)	20	29	40	6	30	4	26	31	30	24	130	71	
18	Hardness(mg/l)	2000	1000	800	36	28	58	52	68	422	54	2600	2200	
19	Fluoride(mg/l)	0.484	1.05	2	0.21	BDL	0.12	BDL	0.14	0.35	0.22	0.43	BDL	
20	Boron(mg/l)	0.99	1.53	3.09	0.025	5.31	BDL	3.78	-	-	2.35	-	-	
21	Sulphate (mg/l)	422.4	498.9	632.3	11.02	7.64	11	12.86	31.8	131	1990.8	425	425	
22	Total Alkalinity(mg/l)	38	92	24	10	30	40	50	58	54	42	90	90	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	2632	2443	3147	8.3	8.1	44.2	44.3	73.7	73.6	640.9	1972	1570	
25	Potassium(mg/l)	99.2	93	124.4	3.6	3.1	3.3	5	4.3	17.1	67.4	80.9	82.3	
26	Calcium as CaCO3(mg/l)	600	540	400	24	24	26	24	28	114	18	800	600	
27	Magnesium(mg/l)	340	111.8	97.2	2.92	0.97	7.78	6.8	9.7	75	8.7	437	389	

RIVER ASSANORA AT ASSANORA 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.1	7.81	8.23	5.64	6.07	6.26	6	7.3	7.74	5.98	6.06	6.22	6-9
2	Temperature °C	29.5	28	27.9	26	25	27	27	28	26	28	28	28	
3	Conductivity µs/cm	39.41	37.63	79.63	69.15	51.37	64.58	80.75	98.84	65.17	53.08	49.4	63.57	

4	Dissolved Oxygen mg/l	6.1	5.4	6.6	6.4	6.7	6.9	6.8	6.2	6.3	6.5	6.2	6.2	4 mg/l or more
5	Turbidity (NTU)	2.21	3.94	38.5	42.3	12.62	3.6	4.22	11.79	3.99	4.15	2.77	2.92	
6	Nitrite Nitrogen mg/l	0.005	0.002	0.03	0.007	BDL	0.001	0.003	0.006	0.002	0.002	0.002	0.001	
7	Nitrogen(Nitrate) mg/l	0.019	0.02	0.07	0.06	0.139	0.15	0.0088	0.03	0.13	0.077	0.07	0.074	
8	Phosphate mg/l	0.007	0.006	0.008	0.013	0.009	0.003	0.004	0.13	0.008	0.012	0.002	0.004	
9	BOD mg/l	1.1	1.4	0.8	0.7	0.7	0.7	1.7	2.7	2.3	1.3	1.1	2.5	3 mg/l or less
10	COD mg/l	6	5	11	7	11	19	10	23	15	2	2	-	
11	Chloride mg/l	7.5	9.5	16.14	15.17	4.86	7.5	7.65	18.1	8.5	11.7	6.8	6.3	
12	Fecal Coliform MPN/100 ml	790	2400	2400	78	490	1300	130	1300	230	1300	1300	790	
13	Total Coliform MPN/100 ml	2400	5400	9200	330	1100	1700	490	2400	700	3500	3500	1300	5000 or less MPN/100 ml
14	Ammonia mg/l	0.007	0.002	0.07	0.09	0.07	0.07	0.024	0.06	0.02	0.017	0.02	0.08	
15	Total Dissolved Solids(mg/l)	24	20	55	41	37	35.5	110	65	-	39	32	43	
16	Total Fixed Solids (mg/l)	22	18	16	20	14	25	69	33	-	24	10	-	
17	Total Suspended Solid (mg/l)	4	3	8	11	8	2	28	11	-	2	1	10	
18	Hardness(mg/l)	20	70	28	38	14	26	25	36	34	16	22	24	
19	Fluoride(mg/l)	0.08	0.15	0.07	BDL	1.08	BDL	0.013	0.75	0.28	BD L	0.83	0.03	
20	Boron(mg/l)	2.15	0.12	0.09	0.01	BDL	2.27	0.95	1.06	-	-	-	-	
21	Sulphate (mg/l)	2.1	2.4	1.36	0.64	1.86	1.98	0.97	1.23	3.6	3.51	2.13	1.95	
22	Total Alkalinity(mg/l)	500	20	32	4	18	32	33	24	32	10	22	20	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	9.1	11.4	6.4	4.6	4.2	9.5	6.3	47.1	7.7	4.1	2.9	5.7	
25	Potassium(mg/l)	4.9	2.3	2.1	2.5	2.2	4.9	0.6	41.1	1.2	0.6	0	1.8	
26	Calcium as CaCO3(mg/l)	10	10	22	26	10	8	17	22	14	10	12	12	
27	Magnesium(mg/l)	2.4	14.6	1.5	2.9	0.972	4.4	1.7	3.4	4.9	4.01	2.43	3	

RIVER VALVANTI AT SANQUELIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.61	7.69	8.9	5.96	7.15	6.36	6.51	7.09	6.8	6.1	6.37	6.92	6-9
2	Temperature ˚C	31.8	27	26	26.3	25.2	28	25	30	26	29	29.5	29	
3	Conductivity µs/cm	46.07	51.54	67.45	63.58	79.21	54.13	70.3	81.82	78.37	75.58	63.55	81.2	
4	Dissolved Oxygen mg/l	7.4	6.8	6.8	7.5	7.5	7.8	7.8	7.1	7.3	7.8	8.1	7.6	4 mg/l or more
5	Turbidity (NTU)	1.71	2.74	8.92	11.04	7.4	2.81	2.72	2.58	4.27	3.92	2.08	2.49	
6	Nitrite Nitrogen mg/l	0.004	0.003	0.05	0.002	0.003	0.001	0.002	0.004	0.004	0.024	0.002	0.01	
7	Nitrogen(Nitrate) mg/l	0.025	0.02	0.18	0.15	0.114	0.04	0.0041	0.06	0.04	0.056	0.08	0.08	
8	Phosphate mg/l	0.011	0.013	0.01	0.019	0.014	0.003	0.03	0.19	0.005	0.019	0.003	0.02	
9	BOD mg/l	2.6	0.9	0.4	0.3	1	1.2	1.2	2.5	2.1	3.4	2.1	3.4	3 mg/l or less
10	COD mg/l	10	7	8	9	18	2	12	3	7	7	3	-	
11	Chloride mg/l	5	11	9.29	9.78	12.63	6.5	8.5	11.74	8	13.6	7.77	6.8	
12	Fecal Coliform MPN/100 ml	4900	7900	4900	4900	7900	2300	3300	7900	7900	7900	17000	2300	
13	Total Coliform MPN/100 ml	7900	13000	7000	7900	11000	4600	4900	13000	11000	17000	28000	4600	5000 or less MPN/100 ml
14	Ammonia mg/l	0.002	0.02	0.15	0.02	0.012	0.02	0.015	0.23	0.02	BDL	0.01	BDL	
15	Total Dissolved Solids(mg/l)	28	25	42	38	55	33	214	51	-	47	40	48	
16	Total Fixed Solids (mg/l)	24	20	20	15	16	29	120	23	-	29	17	-	
17	Total Suspended Solid (mg/l)	6	4	17	21	28	5	17	13	-	8	2	12	
18	Hardness(mg/l)	34	18	52	42	14	22	25	42	30	16	26	36	
19	Fluoride(mg/l)		0.15	0.11	BDL	1.01	BDL	0.08	0.63	0.28	2.92	0.24	0.01	
20	Boron(mg/l)	2.21	0.18	0.14	0.44	BDL	1.92	1.2	1.09	-	-	-	-	
21	Sulphate (mg/l)	2.82	4	2.86	2.71	0.66	2.65	0.9	1.35	3.6	6.34	2.52	2.24	
22	Total Alkalinity(mg/l)	300	20	30	8	22	30	48	28	42	19	24	30	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	8.9	16.9	7.6	4.2	4.8	2.3	6	44.8	9.2	5.3	4.5	7.8	

25	Potassium(mg/l)	5.1	3.5	2.9	2.3	9.3	4.7	1.5	40.6	1.1	0.9	0.3	1.8	
26	Calcium as CaCO3(mg/l)	30	12	16	22	10	10	22	26	10	10	16	20	
27	Magnesium(mg/l)	1	1.5	8.7	4.9	0.972	2.9	1.9	3.9	4.9	6.41	2.43	4	

RIVER MADEI AT DABOSE, VALPOI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	7	6.81	8.17	6.48	7.66	6.35	6.83	7.05	7	5.95	6.75	6.96	6-9
2	Temperature °C	31.2	30	29.3	26.7	26.3	28	29	27	28	28	29.5	28.5	
3	Conductivity µs/cm	125.9	101.5	112.9	72.02	90.96	62.6	90.6	83.42	91.65	105.6	101.2	207.36	
4	Dissolved Oxygen mg/l	6.9	6.3	6.4	8	7.7	7.7	7.7	7.2	7.2	7.4	7.2	6.5	4 mg/l or more
5	Turbidity (NTU)	2.88	3.45	3.91	28.2	40.9	4.6	4.21	2.35	1.35	1.45	1.32	3.15	
6	Nitrite Nitrogen mg/l	0.006	0.002	0.003	0.004	0.006	0.001	0.03	0.007	0.002	0.124	0.006	0.002	
7	Nitrogen(Nitrate) mg/l	0.269	0.09	0.06	0.03	0.07	0.12	0.0018	0.02	0.12	0.206	0.008	0.02	
8	Phosphate mg/l	0.017	0.022	0.02	0.017	0.035	0.028	0.02	0.01	0.005	0.19	0.004	0.004	
9	BOD mg/l	1.5	1.8	0.4	0.8	0.9	0.4	0.5	1	1.1	1.5	2.1	2.6	3 mg/l or less
10	COD mg/l	18	5	12	10	30	11	15	2	11	2	3	-	
11	Chloride mg/l	20	8.5	6.36	10.76	17.97	6	8.58	10.27	7.5	10.7	7.77	27.7	
12	Fecal Coliform MPN/100 ml	78	220	790	330	1300	790	780	220	130	3500	3500	1300	
13	Total Coliform MPN/100 ml	230	340	1300	490	3500	1100	1700	340	230	5400	5400	2300	5000 or less MPN/100 ml
14	Ammonia mg/l	0.011	0.06	0.13	0.14	0.01	0.17	0.017	0.16	0.004	0.026	0.01	0.09	
15	Total Dissolved Solids(mg/l)	70	45	65	47	64	34	198	57	-	62	60	126	
16	Total Fixed Solids (mg/l)	45	30	32	22	36	24	87	24	-	69	26	-	
17	Total Suspended Solid (mg/l)	8	10	42	34	121	5	18	16	-	1	1	7	
18	Hardness(mg/l)	60	22	84	74	20	20	35	30	40	42	48	58	
19	Fluoride(mg/l)	0.1	0.14	0.09	BDL	0.366	0.12	0.09	0.5	0.19	1.27	1.41	0.12	

20	Boron(mg/l)	3.14	0.17	0.2	0.56	BDL	2.31	1.85	1.17	-	-	-	-
21	Sulphate (mg/l)	6.03	1.6	1.73	9.17	2	3.03	0.7	0.83	2	3.8	1.74	3.25
22	Total Alkalinity(mg/l)	680	44	38	6	26	30	47	18	52	23	48	56
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	13.8	4.7	5.2	4.5	4.5	4.9	6.4	44.7	6.9	4.7	4.2	21.3
25	Potassium(mg/l)	6.7	3.2	2.7	2.5	13.9	3.1	0.4	40.6	1	0.9	0.4	3.1
26	Calcium as CaCO3(mg/l)	44	10	38	46	12	8	25	16	24	24	30	36
27	Magnesium(mg/l)	3.9	2.9	11.2	6.8	1.94	2.9	1.7	3.4	3.9	4.01	4.37	5

RIVER KHANDEPAR, OPA, PONDA 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	8.05	7.42	7.37	-	7.34	6.79	6.56	6.71	7.62	7.31	7.29	6.75	6-9
2	Temperature °C	33	30	30	27.1	28.3	28.9	27	27.5	28	29	30	32	
3	Conductivity µs/cm	99.57	73.38	94.6	63.7	42.65	54.24	-	74.03	143.7	88.75	90.28	111.2	
4	Dissolved Oxygen mg/l	6.4	5.8	5.2	7.1	7.5	7.6	7.4	7.9	7.9	7.2	6.8	7.2	4 mg/l or more
5	Turbidity (NTU)	3.87	1.8	3.73	7.1	6.21	11.7	6.66	2.79	1.85	1.6	2.26	2.62	
6	Nitrite Nitrogen mg/l	0.001	0.0015	0.002	0.004	0.002	0.004	0.002	0.023	0.166	0.002	0.003	0.002	
7	Nitrogen(Nitrate) mg/l	0.024	0.01	0.04	0.02	0.16	0.146	0.15	0.12	0.22	0.21	0.24	0.02	
8	Phosphate mg/l	BDL	0.005	0.02	0.004	0.013	0.017	0.003	0.01	BDL	0.003	0.18	0.007	
9	BOD mg/l	1.1	1	2.7	0.8	0.6	0.8	0.7	2.7	2.4	1.8	1.4	1.2	3 mg/l or less
10	COD mg/l	BDL	3	5	4	4	14	4	5	10	7	8	5	
11	Chloride mg/l	2.91	9	6.8	6.5	5.53	11.6	10.76	3.91	12.23	9.5	11	6	
12	Fecal Coliform MPN/100 ml	79	490	790	490	230	490	790	790	230	110	1700	78	
13	Total Coliform MPN/100 ml	140	790	1300	1300	330	1300	1300	1300	330	140	2200	110	5000 or less MPN/100 ml
14	Ammonia mg/l	0.001	0.06	0.01	0.084	0.012	0.12	BDL	0.18	0.07	0.02	0.17	0.002	

15	Total Dissolved Solids(mg/l)	61	60	48	139	32	50	45	43	80	96	77	62	
16	Total Fixed Solids (mg/l)	18	42	20	18	30	37	30	15	8	12	18	41	
17	Total Suspended Solid (mg/l)	10	5	10	28	6	22	10	14	6	7	12	8	
18	Hardness(mg/l)	58	34	40	24	10	16	22	30	42	34	44	38	
19	Fluoride(mg/l)	BDL	0.11	0.7	1.1	0.64	BDL	0.19	0.13	0.53	0.65	0.83	-	
20	Boron(mg/l)	0.08	0.16	3.52	2.8	0.4	BDL	-	-	-	-	-	-	
21	Sulphate (mg/l)	2.94	2.5	3.52	3.1	1.69	2.18	3.33	0.49	1.92	3.6	4.9	16.92	
22	Total Alkalinity(mg/l)	25	36	18	26	6	22	26	20	82	42	52	44	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	44.4	1.9	5.2	6.3	4.9	3.7	17	3.6	10.1	9.8	8.5	7.3	
25	Potassium(mg/l)	10.4	2.2	2.5	2.8	2.1	1	2.9	3	8.1	0.9	0.6	2.7	
26	Calcium as CaCO3(mg/l)	0	28	28	12	6	12	10	14	22	20	22	11	
27	Magnesium(mg/l)	8.75	1.5	2.92	2.9	0.972	0.97	2.92	3.89	4.86	3.4	5.3	6.6	

RIVER KHANDEPAR AT CODLI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	9.09	7.58	7.49	-	7.26	6.99	6.63	6.81	6.49	7.05	7.21	6.94	6-9
2	Temperature ˚C	34.4	30	30.1	26.9	28.1	29	26	27.2	29	29	30	30	
3	Conductivity µs/cm	121.15	58.65	71.73	78.26	45.85	50.7	-	71.25	73.47	78.6	77.88	94.54	
4	Dissolved Oxygen mg/l	6.3	6.7	6.6	7.3	7.5	7.4	7.7	8	8.7	7.7	7.2	7.7	4 mg/l or more
5	Turbidity (NTU)	7.04	1.22	5.56	10.71	6.55	29.1	16.4	2.9	2.78	2.17	2.41	3.53	
6	Nitrite Nitrogen mg/l	0.001	0.0009	0.001	0.002	0.002	0.009	0.01	0.002	0.001	0.003	0.006	0.003	
7	Nitrogen(Nitrate) mg/l	BDL	0.003	0.08	0.05	0.13	0.126	0.16	0.04	0.23	0.22	0.25	0.07	
8	Phosphate mg/l	BDL	0.001	0.01	0.002	0.001	0.04	0.01	0.01	0.02	0.003	0.015	0.02	
9	BOD mg/l	0.2	0.5	1.6	1.1	0.4	0.6	1.4	1.4	1.5	1	0.1	0.7	3 mg/l or less

10	COD mg/l	BDL	20	6	5	4	20	-	3	4	5	5	15	
11	Chloride mg/l	8.74	9	2.43	7	1.38	9.71	25.9	3.91	4.4	8.5	1624	5	
12	Fecal Coliform MPN/100 ml	240	1300	1300	490	490	790	1300	2400	330	330	330	1300	
13	Total Coliform MPN/100 ml	540	3500	2400	1100	790	2400	2400	3500	490	460	700	1700	5000 or less MPN/100 ml
14	Ammonia mg/l	0.001	0.04	0.004	0.01	0.061	0.042	BDL	0.07	0.01	0.008	0.05	0.006	
15	Total Dissolved Solids(mg/l)	78	118	42	80	26	47	56	43	49	40	23	54	
16	Total Fixed Solids (mg/l)	20	90	17	45	20	36	20	23	26	20	10	28	
17	Total Suspended Solid (mg/l)	6	3	13	18	18	98	4	12	17	15	21	3	
18	Hardness(mg/l)	40	38	40	24	14	16	34	20	34	30	74	30	
19	Fluoride(mg/l)	BDL	0.03	0.24	1	0.46	BDL	0.31	BDL	0.22	0.58	0.64	-	
20	Boron(mg/l)	0.005	0.08	BDL	0.3	0.94	BDL	-	-	-	-	-	-	
21	Sulphate (mg/l)	1.65	2.9	1.57	2.7	1.38	4.02	3.89	0.51	0.83	3.3	3.9	2.14	
22	Total Alkalinity(mg/l)	68	24	12	10	6	22	30	18	34	38	52	44	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	43.4	2	4	5.4	4.2	2.8	11.4	3.5	6.3	7.4	6.4	12.1	
25	Potassium(mg/l)	10.4	1	2.3	3.2	2	0.9	3	2.9	3	0.7	0.3	2.9	
26	Calcium as CaCO3(mg/l)	-	18	22	8	8	10	16	12	18	20	14	8	
27	Magnesium(mg/l)	2.92	4.9	4.37	3.9	1.458	1.46	4.37	3.89	3.88	2.4	14.6	5.3	

RIVER KUSHAWATI NEAR BUND AT KEVONA, RIVONA, SANGUEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.57	7.93	6.5	7.62	8	6.49	6.36	7.26	6.78	6.7	6.5	7.2	6-9
2	Temperature °C	28	32.8	29.7	27.2	26.8	28	27	26	27.4	25	26.4	28	
3	Conductivity µs/cm	170.6	131.3	169.4	90.49	51.47	62.64	-	101.5	108.9	146.7	129.2	187.87	
4	Dissolved Oxygen mg/l	4.8	5.6	6.3	7	7.2	7.6	7.7	7.9	8.5	7.3	7.3	7	4 mg/l or more

5	Turbidity (NTU)	2.5	1.61	1.3	8.54	5.66	1.26	7.7	5.39	1.32	2.2	1.1	1.03	
6	Nitrite Nitrogen mg/l	0.004	0.002	0.002	0.004	0.001	0.049	0.001	0.003	0.001	0.003	0.002	0.003	
7	Nitrogen(Nitrate) mg/l	0.2	0.17	0.039	0.26	0.17	0.206	0.11	0.14	0.233	0.19	0.16	0.11	
8	Phosphate mg/l	0.003	0.002	0.009	0.02	0.28	0.002	0.009	0.01	0.004	0.023	0.02	BDL	
9	BOD mg/l	2.2	0.4	0.7	0.6	2.3	0.9	0.7	1	1.1	2.3	0.6	1.4	3 mg/l or less
10	COD mg/l	8	5	4	5	6	2	2.8	3	3	11	3	4	
11	Chloride mg/l	6.9	11	12.14	9.29	6	3.2	3.1	6.8	3.42	9	7	6.5	
12	Fecal Coliform MPN/100 ml	4900	780	2300	2300	2300	1700	7000	1300	1700	2400	230	490	
13	Total Coliform MPN/100 ml	7900	1300	4900	4900	3300	3300	9400	2300	3300	5400	490	1300	5000 or less MPN/100 ml
14	Ammonia mg/l	0	0.04	0.06	0.09	0.04	0.016	0.005	0.02	0.01	0.036	0.02	BDL	
15	Total Dissolved Solids(mg/l)	89	69	123	55	31	43	281	72	65	85	59	104	
16	Total Fixed Solids (mg/l)	35	23	33	23	27	13	171	40	32	80	22	-	
17	Total Suspended Solid (mg/l)	2	5	8	30	15	15	47	33	68	16	6	3	
18	Hardness(mg/l)	88	84	84	20	4	20	22	38	54	54	60	84	
19	Fluoride(mg/l)	0.37	0.07	0.82	0.1	0.53	0.6	0.61	BDL	0.09	0.53	BDL	BDL	
20	Boron(mg/l)	2.1	0.12	0.45	BDL	1.08	BDL	BDL	-	-	-	-	-	
21	Sulphate (mg/l)	3.21	3.3	2.02	3.51	2.28	1.44	3.1	3.34	2.3	6.46	4.82	2.6	
22	Total Alkalinity(mg/l)	74	40	22	8	4	30	60	8	49	66	58	100	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	8	8.6	4.5	7.9	5.6	8.2	1.5	3.2	3.7	5.8	5.2	5.8	
25	Potassium(mg/l)	6.4	3.1	6.9	2.3	2.3	3.9	2.9	2.6	2.9	0.9	1.8	1.8	
26	Calcium as CaCO3(mg/l)	40	48	52	8	2	10	10	26	24	34	32	46	
27	Magnesium(mg/l)	11.66	8.8	7.78	2.92	0.5	2.43	2.9	4.37	7.29	4.9	7	9.2	

RIVER TALPONA AT CANACONA 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	7.17	7.42	7.3	7.42	7.05	6.28	6.2	6.82	6.6	6.14	6.4	5.9	6-9
2	Temperature ˚C	32	33.1	29.5	27.7	26.9	30	32	28	28	27	27	30	
3	Conductivity µs/cm	52.18	106.08	120.9	74.67	60.03	64.61	-	79.72	62.16	68.14	118.16	103.4	
4	Dissolved Oxygen mg/l	7.7	7.1	8.2	7.3	7.6	8	1.07	8.2	7.4	6	6.5	6.5	4 mg/l or more
5	Turbidity (NTU)	3.25	2.1	14.31	2.77	12.43	2.9	8.6	2.49	1.79	3.8	3.4	4.64	
6	Nitrite Nitrogen mg/l	0.002	BDL	0.009	0.006	0.014	0.002	0.003	0.024	0.002	0.002	0.002	0.001	
7	Nitrogen(Nitrate) mg/l	0.06	0.03	0.01	0.19	0.024	0.07	0.15	0.06	0.02	0.02	BDL	0.001	
8	Phosphate mg/l	BDL	BDL	0.01	0.004	0.022	0.01	0.005	0.01	0.01	0.015	0.06	0.01	
9	BOD mg/l	1.7	0.9	3.4	0.5	1	1.6	1.1	1.7	1.6	0.9	1.7	1.3	3 mg/l or less
10	COD mg/l	8	2	13	8	10	17	10	11	11	11	2	-	
11	Chloride mg/l	5.34	13.7	12	10.3	12.23	4.89	60	5.87	7	7.5	27.2	9.78	
12	Fecal Coliform MPN/100 ml	23	23	13	13	79	540	23	23	490	1300	78	23	
13	Total Coliform MPN/100 ml	70	49	33	49	350	920	79	70	1300	3500	130	46	5000 or less MPN/100 ml
14	Ammonia mg/l	0.003	0.16	0.19	0.025	0.03	0.07	0.22	0.04	0.206	0.21	0.01	0.38	
15	Total Dissolved Solids(mg/l)	31	63	71	130	47	39	880	47	35	162	74	50	
16	Total Fixed Solids (mg/l)	12	30	40	72	10	17	780	28	27	144	31	-	
17	Total Suspended Solid (mg/l)	7	22	55	30	32	26	13	17	3	0	2	7	
18	Hardness(mg/l)	20	22	36	20	20	24	20	24	12	28	32	24	
19	Fluoride(mg/l)	BDL	0.22	0.03	BDL	0.16	1.3	1.41	BDL	1.65	0.36	1.91	-	
20	Boron(mg/l)	0.92	0.4	5.06	0.47	0.61	0.21	0.5	0.56	-	-	-	-	
21	Sulphate (mg/l)	2.72	4.34	7.26	1.16	0.68	1.82	2.01	27.2	3.19	1.7	7.48	4.9	
22	Total Alkalinity(mg/l)	40	8	140	12	16	24	160	18	22	28	32	32	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	4	9.9	2.5	4.4	5.1	9.8	6.8	9.4	6.8	8.7	15.6	6.7	

25	Potassium(mg/l)	1	4.3	2.1	3.1	3.5	1.1	3.8	3	3.8	1.2	1.1	1.4	
26	Calcium as CaCO3(mg/l)	14	12	12	64	8	20	8	8	8	14	8	10	
27	Magnesium(mg/l)	1.46	2.43	5.8	2.43	2.9	0.97	2.9	3.89	1	3.4	5.83	3.4	

RIVER SAL AT PAZORCONI, CUNCOLIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	6.55	6.63	6.6	7.3	7.24	6.2	6.6	6.57	5.8	5.91	6.41	6.06	6.5 - 8.5
2	Temperature °C	29	30.5	29	28.9	27.9	30	29	25	29	28	28	28	
3	Conductivity µs/cm	56.95	126.1	109.6	157.3	95.07	100.27	2619	59.78	93.96	101.6	80.16	98.02	
4	Dissolved Oxygen mg/l	6.6	5.3	5.5	6.5	7.29	7.1	6.4	6.4	6.4	6.2	6	5.8	4 mg/l or more
5	Turbidity (NTU)	24.8	18.6	22.2	9.09	11.88	7.31	9.4	10.25	5.65	10.58	8.74	5.9	30 NTU
6	Nitrite Nitrogen mg/l	0.01	BDL	0.15	0.021	0.003	0.003	0.004	BDL	0.005	0.007	0.008	0.003	
7	Nitrogen(Nitrate) mg/l	0.13	0.12	0.22	0.59	0.57	0.23	0.37	0.44	0.08	0.07	0.59	0.084	
8	Phosphate mg/l	0.01	0.06	0.035	0.04	0.03	0.01	0.02	0.02	0.03	0.017	0.005	0.02	
9	BOD mg/l	1	2.2	3.1	1.1	1.1	0.9	0.7	0.8	4.2	2.3	2.3	2.5	3 mg/l or less
10	COD mg/l	4	8	24	11	9	16	8	9	16	-	4	-	
11	Chloride mg/l	3.89	10.8	10	8.3	11.25	11.74	2375	9.78	14.5	2124	10.68	21.5	
12	Fecal Coliform MPN/100 ml	3300	7900	11000	2300	2300	3300	1300	2300	3300	2300	2300	790	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	7000	11000	14000	3300	3300	7000	2300	3300	4900	4600	4900	1400	
14	Ammonia mg/l	0.001	0.13	0.53	0.041	0.03	0.03	0.15	0.01	0.141	0.11	0.11	0.16	
15	Total Dissolved Solids(mg/l)	37	76	63	124	70	58	1509	38	53	174	53	52	
16	Total Fixed Solids (mg/l)	10	40	41	24	42	19	1326	26	43	160	21	-	
17	Total Suspended Solid (mg/l)	34	47	48	22	18	29	72	60	4	38	2	6	
18	Hardness(mg/l)	22	22	8	210	26	36	50	20	26	1200	26	3.4	
19	Fluoride(mg/l)	BDL	0.1	BDL	BDL	0.09	0.24	0.21	BDL	1.24	0.52	0.06	-	
20	Boron(mg/l)	0.92	0.21	0.71	0.29	0.39	1.05	0.42	0.5	-	-	-	-	

21	Sulphate (mg/l)	7.11	165.17	18.4	23.24	13.81	10.78	14	6.43	6.61	161.5	11.9	1.1	
22	Total Alkalinity(mg/l)	30	8	80	14	18	22	340	24	30	24	24	20	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	6.2	10.7	5.9	8.4	8.6	11.3	6.3	8.5	6.3	12.5	9.3	6.7	
25	Potassium(mg/l)	1	4.8	3.2	3.5	3.2	1.1	3.7	3.2	3.7	1.7	0.6	1.7	
26	Calcium as CaCO3(mg/l)	16	12	2	32	14	1200	12	14	14	1000	18	10	
27	Magnesium(mg/l)	1.46	2.43	1.5	43.25	2.9	5.83	9.2	1.46	2.9	48.6	1.94	3.4	

RIVER SAL AT MOBOR 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classi-fication based on des-ignated best use of rivers
1	pH	7.61	7.94	7.01	7.99	6.86	7.11	7.63	7.56	7.78	7.65	8.01	7.85	6.5 - 8.5
2	Temperature °C	32	32.5	27.8	27.6	27.8	31	30	30.09	30	28.5	29	34	
3	Conductivity µs/cm	0.07	155000	3600	31390	47460	48770	1405	-	77060	62400	50470	45760	
4	Dissolved Oxygen mg/l	6.1	5.9	5.3	6.5	6.4	4.8	6.2	2.7	5.8	5.2	5	6.2	4 mg/l or more
5	Turbidity (NTU)	10.32	17.68	57.2	16.02	1.98	10.92	1.24	1.82	7.61	3.39	26.2	2.33	30 NTU

6	Nitrite Nitrogen mg/l	0.014	0.024	0.014	0.01	0.005	0.008	0.007	0.002	0.004	0.005	0.005	0.055	
7	Nitrogen(Nitrate) mg/l	0.06	0.25	0.017	0.02	0.25	0.03	0.04	1.94	0.78	-	0.09	0.75	
8	Phosphate mg/l	0.02	0.04	0.07	0.03	0.1	0.13	0.05	0.531	0.29	0.08	0.04	1.87	
9	BOD mg/l	2.2	1.5	1.8	0.9	1.1	1.2	2.2	1	1.9	0.9	2.7	2.8	3 mg/l or less
10	COD mg/l	-	-	20	-	-	-	-	-	-	-	-	-	
11	Chloride mg/l	17366.9	87568.	907.2	13746	19994	28863.4	25261.4	21493.3	21368.4	22420.3	17484	20546.8	
12	Fecal Coliform MPN/100 ml	130	230	7900	1300	1700	2300	230	230	490	790	790	1300	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	230	490	13000	2400	3300	4900	310	490	700	1100	1300	1700	
14	Ammonia mg/l	0.02	0.32	0.58	0.3	0.03	0.06	0.05	0.038	0.64	0.03	0.13	0.82	
15	Total Dissolved Solids(mg/l)	38425	57225	2100	31690	29262	31592	54839	42598	-	-	34467	34464	
16	Total Fixed Solids (mg/l)	30291	32487	745	16591	15699	11260	30784	26866	-	-	30847	-	
17	Total Suspended Solid (mg/l)	92	72	76	199	130	64	55	163	48	52	499	272	
18	Hardness(mg/l)	6800	3000	296	3000	6000	24000	6800	14000	7500	11500	6400	5400	
19	Fluoride(mg/l)	0.97	5.32	0.93	0.7	1.4	0.39	1.4	0.05	0.87	0.91	0.65	-	
20	Boron(mg/l)	-	3.36	0.32	4.5	4.3	2.1	2.2	-	-	-	-	-	
21	Sulphate (mg/l)	2352.6	64.19	122.5	944	3301.4	2046.8	2204	2447.64	2118.78	3341	4997	2977.22	
22	Total Alkalinity(mg/l)	112	84	14	11	10	8	142	122	112	96	140	120	
23	Phenolphthalein Alkalinity(mg/l)	0.7	12	0	0	6	4	0	6	6	1	0	6	
24	Sodium(mg/l)	6463	5892	441.7	4382	6302	5127	7419	7968	1297	1365	8059	3972	
25	Potassium(mg/l)	179.3	151.7	26.1	197	239	214	206.9	222.1	235.9	220	261.1	268.5	
26	Calcium as CaCO3(mg/l)	1000	1800	80	1000	1200	4500	1200	2000	1000	2500	1000	820	
27	Magnesium(mg/l)	1409.	291.6	52.5	486	1166	4738.5	1360.8	2916		2187	1312	1113	

HARWALE WATERFALL 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.15	7.1	9.18	6.21	7.59	6.63	6.9	7.61	7.0	6.16	7.15	7.07
2	Temperature ˚C	30	31	25	26.1	25	28.3	29	28	26	28	28	28
3	Conductivity µs/cm	77.13	100.6	48.24	73.37	53.75	60.27	47.6	82.22	91.85	80.51	78.5	87.62
4	Dissolved Oxygen mg/l	7.3	7.1	7.8	7.8	7.7	7.6	7.7	8.2	8.5	8.7	8.3	8
5	Turbidity (NTU)	3.16	0	8.74	38	15.9	7.75	4.42	6.22	4.64	9.67	5.52	2.52
6	Nitrite Nitrogen mg/l	0.003	0.003	0.001	0.006	0.002	0.004	0.005	0.006	0.002	0.003	0.002	0.001
7	Nitrogen(Nitrate) mg/l	0.057	0.02	0.13	0.18	0.349	0.02	0.09	0.07	0.06	0.143	BDL	0.1
8	Phosphate mg/l	0.016	0.019	0.02	0.022	0.039	0.004	0.004	0.02	0.02	0.014	0.06	0.01
9	BOD mg/l	2	2.8	1.1	1.3	0.7	1.3	1.4	2	1.5	3.7	1.7	1.2
10	COD mg/l	3	5	7	8	10	25	3	15	15	2	2	-
11	Chloride mg/l	9	13	4.89	9.29	6.31	7	9	7.83	10.5	10.7	27.2	4.4
12	Fecal Coliform MPN/100 ml	2300	4900	4900	4900	7000	7900	4900	3300	1300	1300	78	3300
13	Total Coliform MPN/100 ml	4900	11000	7900	7900	11000	14000	7900	4900	3300	2300	130	4900
14	Ammonia mg/l	0.007	0.05	0.001	0.18	0.024	0.08	0.07	0.43	0.04	0.017	0.01	0.05
15	Total Dissolved Solids(mg/l)	44	40	32	47	38	36	58	54	-	50	74	59
16	Total Fixed Solids (mg/l)	33	29	13	23	-	25	34	26	-	38	31	-
17	Total Suspended Solid (mg/l)	5	6	7	9	33	5	6	22	-	5	2	7
18	Hardness(mg/l)	42	58	58	44	22	24	22	74	28	32	32	42
19	Fluoride(mg/l)	0.03	0.11	0.06	BDL	1.29	0.18	0.03	1.13	0.04	BDL	1.91	0.07
20	Boron(mg/l)	2.53	0.13	0.16	0.76	0.021	1.86	1.84	1.11	-	-	-	-
21	Sulphate (mg/l)	2.7	3.5	3.73	5.35	2.37	2.62	2.1	2.49	3.9	14.2	7.48	4.56
22	Total Alkalinity(mg/l)	500	28	26	6	18	24	22	32	20	12	32	30
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	5

24	Sodium(mg/l)	3.6	1.8	3.3	4.8	4.9	9.1	9.6	44.2	6.2	3.7	15.6	4
25	Potassium(mg/l)	2.2	2.8	2.4	2.5	2.1	6.4	3.6	40.5	0.6	0.5	1.1	1.5
26	Calcium as CaCO3(mg/l)	16	38	22	18	8	8	10	44	18	20	8	20
27	Magnesium(mg/l)	6.3	4.9	8.7	6.3	3.4	3.9	3.2	7.3	2.4	4.01	5.83	5

RIVER BICHOLIM, BARAZAN NAGAR, BICHOLIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	7.51	6.85	7.12	6.64	5.97	6.26	6.45	6.96	7.28	6.18	7.18	7.53	6-9
2	Temperature °C	30	32.5	30.9	27.5	28.2	28.6	28	29	30	26.1	30	29	
3	Conductivity µs/cm	72.1	2890	195.2	225	62.73	95.53	90.44	133.2	133.2	157.4	172.3	203	
4	Dissolved Oxygen mg/l	9	9.1	7.2	7	6.2	6.7	6.9	9.6	7.7	10.7	12	10.1	4 mg/l or more
5	Turbidity (NTU)	3.19	2.82	2.64	33.5	7.78	11.47	4.33	3.81	5.71	4.55	3.15	10.1	
6	Nitrite Nitrogen mg/l	0.01	0.007	0.005	0.02	0.009	0.009	0.002	0.006	0.005	0.01	0.01	0.003	
7	Nitrogen(Nitrate) mg/l	0.26	0.28	0.18	0.09	0.08	0.082	0.141	0.09	0.15	0.72	0.78	0.61	
8	Phosphate mg/l	0.03	0.01	0.01	0.02	0.01	0.06	0.031	0.009	0.01	0.01	0.005	BDL	
9	BOD mg/l	1.9	3.1	2.7	1.9	0.7	1.5	1.5	2.2	1.5	1.4	-	2.3	3 mg/l or less
10	COD mg/l	7	4	3	8	5	4	2	4	4	4	4	-	
11	Chloride mg/l	27.9	582.8	30	49	6.5	10	15.06	9	12.5	17.1	23	14.6	
12	Fecal Coliform MPN/100 ml	7900	7000	11000	4900	7900	7900	3300	4900	4900	7900	4900	13000	
13	Total Coliform MPN/100 ml	1300	11000	17000	7900	13000	22000	4900	7900	7900	13000	7900	17000	5000 or less MPN/100 ml
14	Ammonia mg/l	0.002	0.01	0.01	0.07	0.08	0.08	0.042	0.04	0.02	0.062	0.09	0.25	
15	Total Dissolved Solids(mg/l)	946	1657	302	708	600	57	60	85	285	95	104	160	
16	Total Fixed Solids (mg/l)	-	860	210	444	399	17	40	423	163	32	35	-	
17	Total Suspended Solid (mg/l)	6	15	24	60	50	15	5	5	12	16	15	28	
18	Hardness(mg/l)	74	204	46	30	16	32	30	32	50	34	64	60	

19	Fluoride(mg/l)	0.37	0.39	0.3	0.16	0.77	1.8	BDL	2.1	0.07	0.09	0.09	BDL	
20	Boron(mg/l)	2.1	0.92	0.7	0.41	0.38	0.32	BDL	-	-	-	-	-	
21	Sulphate (mg/l)	5.5	44.46	3.9	9.3	3.3	0.34	2.34	6.9	4.7	2.65	3.6	1.81	
22	Total Alkalinity(mg/l)	66	76	11	8	12	70	40	46	60	50	86	60	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	22.8	282	38.7	21.6	5.6	5.7	9.9	9.3	14.4	9.5	18.8	12.1	
25	Potassium(mg/l)	6.6	11.5	3.7	4.5	2.6	1.6	9.7	3.2	1.5	1.2	1.6	2.5	
26	Calcium as CaCO3(mg/l)	42	70	38	12	8	16	14	20	30	14	14	38	
27	Magnesium(mg/l)	7.78	32.56	1.9	4.4	1.9	3.9	3.89	2.9	4.9	4.86	12.2	5	

MAYEM LAKE AT MAYEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	6.7	6.75	7.42	6.38	5.91	5.64	5.92	6.07	6.05	6.57	6.8	6.15	6-9
2	Temperature ˚C	28.7	35.3	31	27.7	28.3	27.9	28	31	30.5	26.5	30	30	
3	Conductivity µs/cm	17.4	42.42	109.6	61.35	41.59	46.08	62.18	51.78	51.78	62.62	53.28	64.74	
4	Dissolved Oxygen mg/l	6.7	7.1	7.2	7.1	6.7	7.3	4.8	5.7	7.3	7.5	7.3	6.7	4 mg/l or more
5	Turbidity (NTU)	6.29	4.71	6.57	8.67	19.22	1.6	3.08	2.55	3.16	4.31	4.64	7.96	
6	Nitrite Nitrogen mg/l	0.004	0.003	0.003	0.005	0.01	0.003	BDL	0.002	0.004	0.002	0.002	0.004	
7	Nitrogen(Nitrate) mg/l	0.02	0.02	0.02	0.01	0.01	0.02	0.006	0.006	0.02	0.03	0.04	0.05	
8	Phosphate mg/l	0.01	0.01	0.01	0.004	0.017	0.05	BDL	0.04	0.07	BDL	BDL	BDL	
9	BOD mg/l	1.7	3.1	3	1.2	0.9	1.1	1.4	1.2	1.5	1.3	1.7	1	3 mg/l or less

10	COD mg/l	13	6	5	4	3	3	7	3	6	2	3	-	
11	Chloride mg/l	6.9	8.74	22	4.9	4.5	6.5	28.2	7	9	10.8	8	7.3	
12	Fecal Coliform MPN/100 ml	1300	2400	4900	790	4900	3300	780	4900	1300	2400	1300	1300	
13	Total Coliform MPN/100 ml	3500	5400	7900	2400	7900	4900	2300	13000	2300	5400	2400	2200	5000 or less MPN/100 ml
14	Ammonia mg/l	0.01	0.01	0.001	0.03	0.09	0.04	0.067	0.02	0.007	0.367	0.15	0.22	
15	Total Dissolved Solids(mg/l)	17	24	96	58	52	28	41	28	21	45	48	42	
16	Total Fixed Solids (mg/l)	13	15	27	27	25	16	10	318	10	10	12	-	
17	Total Suspended Solid (mg/l)	5	12	7	25	20	12	7	7	12	85	86	33	
18	Hardness(mg/l)	18	16	20	20	30	12	20	18	20	28	26	20	
19	Fluoride(mg/l)	0.08	0.04	0.25	0.19	0.7	1.8	BDL	2.1	0.15	BDL	0.06	0.1	
20	Boron(mg/l)	0.4	0.82	0.63	1.2	0.9	1.1	BDL	-	-	-	-	-	
21	Sulphate (mg/l)	1	2.4	36.3	2.9	4.9	0.17	2.73	76.5	6.1	1.9	1.5	0.46	
22	Total Alkalinity(mg/l)	22	22	7	6	10	46	30	30	30	20	36	24	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	-	0	0	0	0	0	
24	Sodium(mg/l)	11.9	7.4	13.9	4.5	5	3.1	12.5	2.2	8.4	5.6	12.5	5.4	
25	Potassium(mg/l)	8	4.3	2.4	2.3	2.2	0.9	1.4	2.9	0.7	0.6	0.5	1.6	
26	Calcium as CaCO3(mg/l)	12	10	4	10	20	10	8	14	10	8	9	14	
27	Magnesium(mg/l)	1.46	1.46	3.9	2.4	2.4	0.5	2.92	0.97	2.4	4.86	4.4	1	

CUMBHARJUA CANAL, CORLIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	6.93	7.64	7.64	5.75	6.88	6.72	6.99	6.92	6.93	7.16	7.26	7.67	6.5 - 8.5
2	Temperature ˚C	30.8	30	30	27	28	29	31	30	30	27.2	28	31	
3	Conductivity µs/cm	46130	59360	59360	588	5560	5430	897.8	30010	37520	51040	42840	37470	
4	Dissolved Oxygen mg/l	6.2	4.4	4.4	6.8	5.37	5.4	6.8	6.7	5.4	6.3	4.5	5.4	4 mg/l or more
5	Turbidity (NTU)	11.03	9.66	1.5	2.5	18.23	5.37	15.45	6.06	9.57	8.84	7.02	15.65	30 NTU
6	Nitrite Nitrogen mg/l	0.002	0.22	0.019	0.003	0.009	0.005	0.004	0.007	0.009	0.04	0.01	0.02	
7	Nitrogen(Nitrate) mg/l	0.03	0.07	0.06	0.31	0.27	0.3	0.28	0.12	0.098	0.035	0.08	0.08	
8	Phosphate mg/l	0.03	0.037	0.029	0.016	0.008	0.02	0.01	0.02	0.051	0.04	0.03	0.44	
9	BOD mg/l	3.2	1.5	1.5	1.3	0.8	0.08	0.7	4.6	0.4	3.9	1.1	3.1	3 mg/l or less
10	COD mg/l	-	-	-	8	7	-	-	-	-	-	-	-	
11	Chloride mg/l	17848	12621	12487	172	45	2374.3	2260	2120	29352	20993	16995	16619	
12	Fecal Coliform MPN/100 ml	790	78	330	170	1300	1700	330	790	790	170	78	78	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	1300	130	700	270	2400	4900	700	1300	1700	220	130	130	
14	Ammonia mg/l	0.01	0.12	0.09	0.58	0.13	0.09	0.08	0.07	0.06	0.028	0.12	BDL	
15	Total Dissolved Solids(mg/l)	34594	32887	2530	1286	186	175	665	213	2145	1988	238870	20462	
16	Total Fixed Solids (mg/l)	27579	23089	1215	271	88	77	516	109	1099	984	24702	-	
17	Total Suspended Solid (mg/l)	154	106	20	20	9	12	13	66	38	98	141	130	
18	Hardness(mg/l)	5600	4840	4000	64	28	468	90	5200	7000	6800	4920	8600	

19	Fluoride(mg/l)	1.67	0.9	0.81	0.13	0.69	0.26	0.28	0.29	0.41	1.4	0.9	BDL	
20	Boron(mg/l)	2.17	1.37	1.1	0.06	0.07	0.09	0.08	-	0.16	-	-	-	
21	Sulphate (mg/l)	558	2866	1013	193.2	68	68	34.3	50	74.53	2627	2111	1964	
22	Total Alkalinity(mg/l)	134	300	56	4	6	86	76	76	96	104	118	100	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	6665	7535	7815	80.1	24.9	669.9	129.1	260.6	802.7	1118	5893	4910	
25	Potassium(mg/l)	254.9	246.5	289.5	4.9	3	33.4	4.9	19.1	145	179.4	216.3	275.7	
26	Calcium as CaCO3(mg/l)	1000	1100	1000	14	18	108	24	1200	1400	3000	860	2200	
27	Magnesium(mg/l)	1118	908.8	729	12.2	2.4	87.5	16	972	1360.8	923	987	1555	

RIVER ZUARI AT PANCHAWADI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	6.62	6.95	7.14	-	7.36	6.82	6.81	6.96	6.58	6.77	6.82	6.82	6.5 - 8.5
2	Temperature ˚C	33.3	32	31	27.5	27.2	29.2	27.5	30	30	29	31	30	
3	Conductivity µs/cm	27420	22330	26120	153.2	87.2	597.5	17960	3536	14190	26350	16450	12160	
4	Dissolved Oxygen mg/l	5.5	5.2	4.7	5.9	7.1	7.9	7.1	5.3	5.5	5.2	5	4.8	4 mg/l or more
5	Turbidity (NTU)	5.14	3.58	12.2	36.1	5.12	3.32	4.08	5.91	9.66	11.39	6.32	16.6	30 NTU
6	Nitrite Nitrogen mg/l	0.011	0.001	0.006	0.005	0.003	0.003	BDL	0.058	0.002	0.04	0.04	0.013	
7	Nitrogen(Nitrate) mg/l	0.014	0.12	0.17	0.18	0.18	0.019	0.07	0.004	0.56	0.68	0.7	0.06	

8	Phosphate mg/l	BDL	0.001	0.04	0.018	0.002	0.012	0.01	0.02	0.03	0.018	0.003	0.03	
9	BOD mg/l	1.7	0.5	2.6	1.4	0.6	1.8	1.5	2.6	2.8	1.5	1	0.6	3 mg/l or less
10	COD mg/l	BDL	-	-	16	14	8	-	-	11	-	-	-	
11	Chloride mg/l	5220.9	5798	1.65	424	92.17	136	244.6	733.82	3669	6622	6900	5748	
12	Fecal Coliform MPN/100 ml	490	330	450	1700	1300	2300	1300	780	790	3300	1100	490	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	790	490	480	3300	1700	3300	1700	1100	2400	4900	1400	940	
14	Ammonia mg/l	0.001	0.002	0.004	6.05	0.004	0.065	0.01	0.1	BDL	0.002	0.09	0.02	
15	Total Dissolved Solids(mg/l)	18194	6510	14888	158	53	320	406	2200	7879	13179	31539	6860	
16	Total Fixed Solids (mg/l)		6001	11863	108	25	100	53	1193	4521	9025	28724	5739	
17	Total Suspended Solid (mg/l)	41	20	22	46	12	42	4	18	51	100	54	71	
18	Hardness(mg/l)	1920	8200	3240	24	20	640	-	240	1500	4800	4800	1400	
19	Fluoride(mg/l)	1.2	0.6	1.65	1.3	0.46	BDL	0.28	BDL	0.55	1.5	1.15	-	
20	Boron(mg/l)	-	0.45	3.21	2.9	2.77	4.4	-	-	-	-	-	-	
21	Sulphate (mg/l)	523.6	469	798	10.2	2.74	18.2	542.7	92.56	165.9	595	600	434	
22	Total Alkalinity(mg/l)	72	36	20	24	4	32	24	26	34	56	70	46	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	8402	2301	3102	11.3	9.4	84.5	93.3	374.1	1277	764.9	2085	1439	
25	Potassium(mg/l)	100.2	99.7	143	3.8	2.4	14	4.2	11.8	47.3	95.8	99.7	57.2	
26	Calcium as CaCO3(mg/l)		600	480	14	6	24	20	50	300	1400	400	240	
27	Magnesium(mg/l)	379.1	1847	670.68	2.4	3.402	149.7	13.12	46.17	291.6	826	1069	282	

RIVER ZUARI AT CORTALIM 2016-2017

	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	7.5	6.38	6.4	7.42	7.3	7.09	7.28	8.04	7.44	7.4	7.6	7.3	6.5 - 8.5
2	Temperature ˚C	29	31.5	30.6	29.3	28	30.0	30	28	28.9	27	28.6	29.5	
3	Conductivity µs/cm	44120	76300	55620	137	1260	12440	-	3166	54470	57760	47830	48810	
4	Dissolved Oxygen mg/l	4.6	3.7	5	6.5	6	5.9	6	5.4	5.3	6	5.4	4.9	4 mg/l or more
5	Turbidity (NTU)	11.42	72.7	65.2	144	8.04	25.8	17.56	35.1	8.41	7.44	8.73	6.09	30 NTU
6	Nitrite Nitrogen mg/l	0	0.007	0.047	0.063	0.01	0.003	0.003	0.025	0.04	0.025	0.02	0.007	
7	Nitrogen(Nitrate) mg/l	0.18	0.18	0.048	0.45	0.15	0.51	0.6	0.18	0.26	0.16	0.04	0.03	
8	Phosphate mg/l	0.02	0.063	0.032	0.04	0.19	0.04	0.03	0.05	0.05	0.09	0.04	0.02	
9	BOD mg/l	1.9	1.4	4.3	2.6	0.9	2.3	1.6	2.2	2.5	1.5	1.2	0.4	3 mg/l or less
10	COD mg/l	-	-	-	18	16	25.0	-	-	-	-	-	-	
11	Chloride mg/l	9906.5	19619	18577	319.94	300	4493.00	4100	14472.8	16609.	231180	16270	23867	
12	Fecal Coliform MPN/100 ml	2300	3300	4900	7900	2300	3300	4900	4900	1300	1100	200	200	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	4600	4900	7900	11000	3300	7000	7900	7900	2300	1400	450	450	
14	Ammonia mg/l	0.01	0.05	0.08	0.14	0.18	0.09	0.13	0.25	0.04	0.184	0.03	BDL	
15	Total Dissolved Solids(mg/l)	38177	38850	35674	89	693	8595	23249	24546	29147.8	31104	33666	72790	
16	Total Fixed Solids (mg/l)	29136	9265	30472	49	646	6099	12314	20842	24516	27196	28493	-	
17	Total Suspended Solid (mg/l)	19	132	143	170	66	252	233	198	161	66	189	153	

18	Hardness(mg/l)	7500	4200	5400	1280	84	1800	3400	6200	5700	5920	5800	11200	
19	Fluoride(mg/l)	1.44	0.99	1.38	BDL	0.73	0.64	0.83	1.54	1.81	0.73	1.22	BDL	
20	Boron(mg/l)	-	0.92	3.69	2.13	1.33	0.74	0.6	-	-	-	-	-	
21	Sulphate (mg/l)	2760.2	514	2640	59.85	3.11	177.1	181	3167.6	1541	4404.4	2928	3562	
22	Total Alkalinity(mg/l)	118	102	26	12	6	52	118	24	101	124	104	114	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0.6	0	0	0	
24	Sodium(mg/l)	6425	9394	7005	188.6	175.2	6932	3124	7681	6583	6805	6747	5667	
25	Potassium(mg/l)	168.5	277.8	284	16.6	8.5	1436	100.6	309	217	239.9	244.3	286.9	
26	Calcium as CaCO3(mg/l)	1500	1200	1100	340	10	400	800	1000	1000	1000	1100	2000	
27	Magnesium(mg/l)	1458	729	1045	228.42	18	340.2	631.8	1263.6	1142	1195.6	1142	2236	

CREEK AT DANDO MOLLO, VELSAO, MORMUGAO 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C river as per CPCB classification based on designated best use of rivers
1	pH	8.12	6.61	7.94	7.01	6.16	7.04	6.64	7.14	7.06	7.3	7.88	6.92	6-9
2	Temperature ˚C	30	31.5	30	26.7	27.1	30	28	27.2	27	25	27	32	
3	Conductivity µs/cm	31740	60300	55620	985	14430	562.96	2703	-	22450	46270	18770	13380	
4	Dissolved Oxygen mg/l	8.7	8.8	5.2	2.9	5.8	5.5	6.4	6	5.28	4.17	11.5	10.4	4 mg/l or more
5	Turbidity (NTU)	4.52	51.5	23.3	5.16	6.18	18.21	27.4	6.87	5.83	2.23	3.03	1.6	
6	Nitrite Nitrogen mg/l	1.254	0.04	0.23	0.3	0.07	0.103	0.11	0.416	0.509	0.093	0.89	4.93	

7	Nitrogen(Nitrate) mg/l	17.06	3.62	0.87	0.49	0.06	1.78	1.2	5.05	6.54	11.63	13.61	10.28	
8	Phosphate mg/l	0.514	0.16	0.073	0.2	0.23	0.11	0.02	0.057	0.273	0.632	6.2	0.23	
9	BOD mg/l	5.4	5.2	3.9	2.5	0.6	2.2	1.8	2.8	2.78	1.4	5.1	4.2	3 mg/l or less
10	COD mg/l	-	-	-	28	-	8	-	16	34	34	-	-	
11	Chloride mg/l	7460.	57482.2	151	315	6248	1467.6	652	2374.26	4373.6	19463.8	5342	2935.26	
12	Fecal Coliform MPN/100 ml	790	230	11000	7900	11000	2300	230	3500	2400	2400	4900	78	
13	Total Coliform MPN/100 ml	1300	330	17000	17000	17000	3300	490	9200	5400	5400	7900	130	5000 or less MPN/100 ml
14	Ammonia mg/l	0.02	0.12	0.504	0.3	0.93	0.08	0.04	0.157	0.631	0.02	8.28	0.02	
15	Total Dissolved Solids(mg/l)	19663	16627	340	1275	1100	454	251	2434	296.5	37341	13979	7349	
16	Total Fixed Solids (mg/l)	12742	12132	198	743	645	83	122	1203	8226	1831	9928	-	
17	Total Suspended Solid (mg/l)	65	118	37	8	12	11	9	13	49	37	879	155	
18	Hardness(mg/l)	7000	194	60	190	2000	3200	20	5500	3000	7500	2200	1000	
19	Fluoride(mg/l)	0.76	4.86	0.73	0.3	0.38	1.01	0.4	0.17	4.57	1.53	0.5	-	
20	Boron(mg/l)	-	5.26	0.014	1.6	1.6	0.98	1.5	-	-	-	-	-	
21	Sulphate (mg/l)	654.5	1128.3	28.9	53.9	40.7	63.3	4.1	864.62	9.57	4831.6	1773	520.89	
22	Total Alkalinity(mg/l)	60	48	8	9	16	14	76	56	82	94	50	48	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0.2	0	0	
24	Sodium(mg/l)	2831	2354	72.8	152.1	18.32	1498	8.9	751.6	667.9	1141	2825	1579	
25	Potassium(mg/l)	121.4	121.4	6.3	10.4	80.7	61.4	3.2	26.7	133.9	184.9	125.5	104.4	
26	Calcium as CaCO3(mg/l)	600	118	44	64	1600	800	16	1400	1500	2400	500	320	
27	Magnesium(mg/l)	155.2	18.5	3.89	30.6	16	583.2	0.97	996.3	364.5	5400	413	165	

RIVER MANDOVI NEAR MANDOVI BRIDGE, PANAJI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	7.38	7.82	8.07	6.97	6.11	6.94	6.84	7.43	7.63	7.6	7.5	7.97	6.5 - 8.5
2	Temperature ˚C	32	31	30.2	29.3	28.9	33	30	29	30	29	30	31	
3	Conductivity µs/cm	47110	79750	65350	680	20490	8675	7680	7990	65410	59470	46770	50080	
4	Dissolved Oxygen mg/l	3.6	6.2	6.7	6.6	6	7.6	7.2	4.9	4.48	5.6	6	6.5	4 mg/l or more
5	Turbidity (NTU)	202	8.59	3.34	24.9	16.96	16.1	18.11	5.04	3.77	3.7	3.83	4.26	30 NTU
6	Nitrite Nitrogen mg/l	0.011	0.002	0.002	0.007	0.009	0.01	0.004	0.007	0.009	0.006	0.005	0.005	
7	Nitrogen(Nitrate) mg/l	0.09	0.261	BDL	0.57	0.39	0.08	0.11	0.16	0.11	0.12	0.15	0.16	
8	Phosphate mg/l	0.02	0.042	0.02	0.03	0.03	0.02	BDL	0.036	0.032	0.02	0.007	0.02	
9	BOD mg/l	2.5	1.8	2.9	0.8	1.1	1.3	1.1	1.9	1.38	2.2	2.3	2.2	3 mg/l or less
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-	
11	Chloride mg/l	15564	23919	20009	3351	6017.28	1991	10053.27	10101.5	19427	11073.2	15870	21743	
12	Fecal Coliform MPN/100 ml	230	130	130	5400	5400	2300	230	3300	2300	490	45	1300	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	330	210	230	9200	9200	4900	490	7900	3300	700	78	1700	
14	Ammonia mg/l	0.017	0.072	0.03	0.11	0.01	0.16	0.07	0.06	0.03	0.03	0.13	BDL	
15	Total Dissolved Solids(mg/l)	25016	50142	44191	481	12698	5553	4998	5726	36670	30500	39601	85391	
16	Total Fixed Solids (mg/l)	15581	-	36390	333	8695	4036	2081	3120	27312	26673	25958	-	
17	Total Suspended Solid (mg/l)	37	127	162	34	54	4	52	75	256	72	176	149	

18	Hardness(mg/l)	6600	7500	4900	72	2500	840	3320	4600	6000	5200	6400	9000	
19	Fluoride(mg/l)	1.048	1.69	3.3	0.23	BDL	0.29	0.43	0.21	0.56	1.26	0.61	BDL	
20	Boron(mg/l)	1.81	3.56	4.78	0.09	6.07	0.32	3.59	-	-	2.4	-	-	
21	Sulphate (mg/l)	2421	2749.1	2667.6	37.4	903.04	351	1018.12	2567	2654	2121.2	2380	2754	
22	Total Alkalinity(mg/l)	60	120	28	10	70	44	88	112	112	86	130	124	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	8222	8566	10170	91	3243	1103	1182	5147	7193	1314	6489	5821	
25	Potassium(mg/l)	182	274	289.6	6.7	132.3	52.3	173.3	161.9	217	188.4	238.5	293	
26	Calcium as CaCO3(mg/l)	1000	1100	1100	24	400	16	520	800	1300	1200	1400	1800	
27	Magnesium(mg/l)	1361	1555.2	923.4	11.7	510.3	200	3480.4	923	1142	972	1215	1750	

RIVER MANDOVI AT TONCA MARCELA 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for SW II river as per CPCB classification based on designated best use of rivers
1	pH	38.89	7.17	6.83	7	6.05	6.84	6.83	6.97	6.97	6.18	7.25	7.53	6.5 - 8.5
2	Temperature ˚C	29.2	32.2	30	27.2	25.7	27	29	30	29	25	29	31	
3	Conductivity µs/cm	7100	67220	53040	156.8	89.05	6060	269.5	6428	30250	47730	34500	34180	
4	Dissolved Oxygen mg/l	4.8	5.3	4.4	6.8	7.2	6.9	7.6	6	4.9	5.9	5.5	5.4	4 mg/l or more
5	Turbidity (NTU)	61.6	4.61	3.44	28.4	26.5	2.82	12.08	1.35	7.9	6.03	5.39	15.51	30 NTU
6	Nitrite Nitrogen mg/l	0.07	0.048	0.04	0.008	0.014	0.004	0.002	0.004	0.009	0.14	0.14	0.03	
7	Nitrogen(Nitrate) mg/l	0.29	0.05	0.05	0.04	0.05	0.03	0.015	0.011	0.08	0.16	0.15	0.04	

8	Phosphate mg/l	0.02	0.02	0.02	0.01	0.01	0.02	0.007	0.008	0.03	0.02	0.01	0.04	
9	BOD mg/l	1.7	2.2	1.4	1.9	0.4	1.5	1.7	1.9	1.2	1.2	1.6	1	3 mg/l or less
10	COD mg/l	-	-	-	8	7	-	5	-	-	-	-	-	
11	Chloride mg/l	15899	15784.11	21618	90	20	3498.9	55.4	5120	8122	9882	13495	11413	
12	Fecal Coliform MPN/100 ml	790	1300	5400	3500	1300	1700	1300	4900	4900	1700	1300	5400	100 or less MPN/100 ml
13	Total Coliform MPN/100 ml	1700	2400	9200	9200	1700	3300	2200	7900	7900	3500	3500	9200	
14	Ammonia mg/l	0.02	0.01	0.04	0.08	0.07	0.06	0.03	0.06	0.11	0.1	0.001	0.31	
15	Total Dissolved Solids(mg/l)	29642	38221	47866	789	764	3515	183	3876	14801	35265	37319	25274	
16	Total Fixed Solids (mg/l)	21431	25408	27448	380	350	1846	107	4844	11787	16119	16779	-	
17	Total Suspended Solid (mg/l)	10	30	29	20	25	30	28	27	62	55	62	161	
18	Hardness(mg/l)	5500	5000	4800	26	1000	1200	420	1000	1400	1600	4800	4120	
19	Fluoride(mg/l)	1.49	1.7	1.2	0.3	1	0.67	0.63	0.72	1.6	3.34	0.85	2.69	
20	Boron(mg/l)	-	63.93	0.9	0.36	0.34	0.31	0.446	-	-	-	-	-	
21	Sulphate (mg/l)	1537.	2425.54	2408	1998	9.5	85	9.23	370.6	884	869.8	1250	669	
22	Total Alkalinity(mg/l)	96	102	14	3	8	78	36	58	80	800	118	86	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	2	
24	Sodium(mg/l)	5533	7411	8233	10.5	11.6	762.8	40.1	897.6	862.6	1029	4771	4830	
25	Potassium(mg/l)	163.7	241	251	2.8	3.9	37.5	3.6	30.4	117	142.2	185.1	198.7	
26	Calcium as CaCO3(mg/l)	1000	840	1200	14	600	400	100	600	400	600	800	880	
27	Magnesium(mg/l)	1093.	1010.88	875	2.9	97	194	77.8	97.2	243	243	972	787	

RIVER SELAULIM LAKE AT SELAULIM, SANGUEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for class C as per CPCB classification based on designated best use
1	pH	7.56	8.64	7.2	7.61	7.5	6.95	6.55	7.28	6.58	6.9	7.2	6.9	6-9
2	Temperature ˚C	29	35	31.3	29.5	28.5	30	29	30	29	29	26	30.9	
3	Conductivity µs/cm	53.6	37.15	46.47	71.75	46.2	47.81	-	51.4	52.08	54.88	50.69	52.16	
4	Dissolved Oxygen mg/l	4.3	6.9	6.3	7.6	7.3	7.8	8.2	7.7	7.3	6.1	8.3	7	4 mg/l or more
5	Turbidity (NTU)	7.23	1.08	3.99	2.89	1.51	1.25	1.25	1.91	3.25	1.57	1.04	1	
6	Nitrite Nitrogen mg/l	0.001	0.001	0.001	0.003	0.002	0.013	0.002	0.001	0.002	0.001	0.001	0.001	
7	Nitrogen(Nitrate) mg/l	0.18	0.16	0.003	0.18	0.2	0.001	BDL	0.02	0.08	0.02	0.01	0.01	
8	Phosphate mg/l	0.003	0.0004	0.004	0.004	0.36	0.01	0.001	0.01	0.009	0.025	0.006	BDL	
9	BOD mg/l	0.3	0.1	0.6	0.9	3.4	0.6	0.8	1.1	1.5	0.9	0.6	0.1	3 mg/l or less
10	COD mg/l	5	4	7	5	12	3	2	2	2	8	8	7	
11	Chloride mg/l	4.4	8.5	5.34	6.36	5.5	2.8	3	3.4	3.42	7	6	5.5	
12	Fecal Coliform MPN/100 ml	NIL	NIL	NIL	NIL	7.8	23	NIL	78	4.5	NIL	NIL	NIL	
13	Total Coliform MPN/100 ml	<1.8	<1.8	7.8	7.8	49	79	6.8	23	13	<18	<18	<18	5000 or less MPN/100 ml
14	Ammonia mg/l	0.01	0.02	0.08	0.23	0.02	0.056	0.003	0.06	0.04	0.022	0.03	BDL	
15	Total Dissolved Solids(mg/l)	148	26	28	45	26	32	181	39	32	34	25	49	
16	Total Fixed Solids (mg/l)	35	10	11	22	23	24	183	22	19	19	5	-	
17	Total Suspended Solid (mg/l)	7	8	10	12	8	5	10	3	25	9	3	38	

18	Hardness(mg/l)	22	26	18	16	4	16	18	20	24	16	26	20	
19	Fluoride(mg/l)	0.02	0.18	0.63	0.04	0.46	1.3	0.41	0.24	0.15	0.46	BDL	BDL	
20	Boron(mg/l)	0.6	0.13	0.06	BDL	1.12	BDL	BDL	-	-	-	-	-	
21	Sulphate (mg/l)	2.77	1.8	2.17	2.65	1.44	1.95	2.3	0.81	1.42	7.89	0.89	2.1	
22	Total Alkalinity(mg/l)	22	24	8	8	4	22	56	6	17	24	24	32	
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0	
24	Sodium(mg/l)	9.6	8.2	4.8	5.2	4.2	8.3	1.9	3	3.2	3.1	3.6	8	
25	Potassium(mg/l)	2.3	2.4	2.5	3.1	2.1	6.3	2.9	2.1	2.9	0.3	0.1	1.6	
26	Calcium as CaCO3(mg/l)	10	12	10	10	2	6	8	10	8	12	10	10	
27	Magnesium(mg/l)	2.916	3.4	1.94	1.46	0.5	2.43	2.4	2.43	4	1	4	2.4	

AGRICULTURAL CANAL UPSTREAM OF CUNCOLIM INDUSTRIAL ESTATE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Limit for Class E as per CPCB classification based on designated best use
1	pH	6.66	7.61	7.5	7.41	7.35	Canal was dry	Canal was dry	Canal was dry	Canal was dry	6.09	6.93	6.15	6-8.5
2	Temperature °C	29.5	31.6	29.2	29.8	29.9					27	29	29	
3	Conductivity µs/cm	41.96	62.96	49.3	61.22	55.99					66.95	66.61	126.2	Max 2250 µs/cm
4	Dissolved Oxygen mg/l	6.5	7.6	6.7	12.8	4.21					7.3	6.7	6.1	
5	Turbidity (NTU)	2.66	1.64	7.56	1.01	0.46					3.11	2.72	7.04	
6	Nitrite Nitrogen mg/l	0.002	BDL	0.004	0.007	0.001					0.003	0.002	0.002	

7	Nitrogen(Nitrate) mg/l	0.01	BDL	0.05	0.73	0.16				0.61	0.03	0.01		
8	Phosphate mg/l	0.001	BDL	0.004	0.008	0.09				0.007	0.004	0.02		
9	BOD mg/l	1.4	1.8	2.3	2	0.5				0.7	2	1.8		
10	COD mg/l	4	9	7	10	11				10	21	-		
11	Chloride mg/l	1.94	8.3	6.5	7.3	8.32				7.5	9.7	14.68		
12	Fecal Coliform MPN/100 ml	1300	2400	2400	330	490				1300	1300	1700		
13	Total Coliform MPN/100 ml	3500	5400	3500	490	700				2200	3500	3500		
14	Ammonia mg/l	0.01	0.04	0.16	0.025					0.06	0.04	0.3		
15	Total Dissolved Solids(mg/l)	25	37	32	98	38				152	40	57		
16	Total Fixed Solids (mg/l)	14	10	12	19	9				109	16	-		
17	Total Suspended Solid (mg/l)	15	6	44	43	18				15	2	5		
18	Hardness(mg/l)	22	62	20	20	20				16	22	2.43		
19	Fluoride(mg/l)	BDL	0.09	BDL	BDL	0.97				0.16	0.92	-		
20	Boron(mg/l)	0.88	BDL	1.52	1.36	0.76				-	-	-		Max 2mg/l
21	Sulphate (mg/l)	2.09	2.81	6.06	1.56	2.71				3.1	3.7	5.7		
22	Total Alkalinity(mg/l)	34	6	60	14	20				28	26	24		
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0				0	0	0		
24	Sodium(mg/l)	0.8	5.8	2	4.7	4.6				7.5	6.9	14.2		
25	Potassium(mg/l)	0.3	4.3	1	3.2	3				1.6	0.5	1.5		
26	Calcium as CaCO3(mg/l)	14	14	6	14	14				10	10	12		
27	Magnesium(mg/l)	1.94	11.7	3.4	1.46	1.5				1.9	2.92	2.43		

RUMDER LAKE, NUVEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.86	8.05	7.19	6.69	6.08	7.08	6.82	6.43	6.28	6.45	6.44	8.03
2	Temperature ˚C	31	29.8	29	27.5	28.3	30	30	30.04	27	27.5	29	30
3	Conductivity µs/cm	120	224.69	69.47	133.5	93.93	94.28	134.5	-	176.7	171.8	187.5	160.7
4	Dissolved Oxygen mg/l	11.1	6.8	5	4.4	6	5.8	7.7	7.2	2.95	7	1.9	3.5
5	Turbidity (NTU)	21.7	28.9	105	15.53	16.2	12.7	3.08	5.97	25.3	8.93	22.9	9.19
6	Nitrite Nitrogen mg/l	0.005	0.004	0.028	0.03	0.02	0.081	0.05	0.284	0.476	0.029	0.01	0.247
7	Nitrogen(Nitrate) mg/l	0.06	0.13	0.059	0.045	0.05	0.10	0.3	10.35	1.37	-	0.64	2.18
8	Phosphate mg/l	0.031	0.007	0.166	0.05	0.04	0.04	0.2	0.144	0.035	0.02	0.09	0.21
9	BOD mg/l	1.6	6.4	1.5	0.3	0.9	2.6	1.5	-	-	3.3	4	6
10	COD mg/l	14	13	20	20	20	6	12	24	33	14	15	16
11	Chloride mg/l	244.6	32.8	6.8	5	25	13.21	20	15	109.97	29.57	32	20.55
12	Fecal Coliform MPN/100 ml	780	330	7900	2300	2300	2300	2300	2300	4900	2300	2300	780
13	Total Coliform MPN/100 ml	1300	490	13000	3300	4900	4600	4600	4900	7900	4900	3300	1100
14	Ammonia mg/l	0.105	0.2	0.656	0.07	0.1	0.16	0.5	0.215	0.766	1.191	0.14	0.05
15	Total Dissolved Solids(mg/l)	161	120	70	291	284	68	3728	199	516	-	1350	139
16	Total Fixed Solids (mg/l)	112	70	28	264	200	28	2325	113	308	459	93	-
17	Total Suspended Solid (mg/l)	52	75	70	9	19	4	4	10	36	31	35	29
18	Hardness(mg/l)	2000	64	NIL	36	28	38	800	100	60	54	52	42
19	Fluoride(mg/l)	0.1	2.73	BDL	0.3	1.69	0.33	1.6	0.07	3.1	0.24	0.03	-
20	Boron(mg/l)	-	1.07	0.175	1.2	1.2	0.89	1.1	-	-	-	-	-
21	Sulphate (mg/l)	15.4	1.75	1.28	7.5	7.07	5.8	10.2	24.16	11.66	5.35	24.93	1.72

22	Total Alkalinity(mg/l)	76	50	4	6	8	10	74	40	48	54	58	54
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	16.2	11.63	6	8	8.4	6.7	580.1	10.8	57.9	17.3	29.9	11.9
25	Potassium(mg/l)	5.1	3.8	4	3.1	2.6	1.7	23.6	3.7	43	25	2.1	0.8
26	Calcium as CaCO3(mg/l)	1000	34	NIL	16	16	18	106	26	22	50	30	30
27	Magnesium(mg/l)	243	7.3	NIL	4.9	2.9	4.9	168.6	17.98	9.234	0.972	5	2.92

RIVER SAL AT ORLIM BRIDGE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.94	7.84	6.77	6.81	6.54	7.08	6.84	7.01	7.09	7.46	7.47	8.11
2	Temperature ˚C	31.2	31	28.1	28	28.6	32	30	31.5	29	27	29.5	32
3	Conductivity µs/cm	42400	91730	508.6	573.5	779.45	1564	82.92	-	40850	4380	33600	29490
4	Dissolved Oxygen mg/l	14.1	7	3.2	4.5	5.3	6.5	5.1	4.3	4.43	6.27	5.9	8.4
5	Turbidity (NTU)	14.81	19	42.5	13.3	7.36	5.3	4.25	4.79	6.88	3.26	5.57	1.26
6	Nitrite Nitrogen mg/l	0.007	0.004	0.094	0.03	0.03	0.028	0.04	0.147	0.152	0.026	0.011	0.003
7	Nitrogen(Nitrate) mg/l	1.05	0.26	BDL	0.01	0.13	0.38	0.52	30.16	1.43	0.1	1.37	0.99
8	Phosphate mg/l	0.038	0.074	0.081	0.06	0.62	0.03	0.02	0.054	0.027	0.078	0.04	0.1
9	BOD mg/l	12.5	6.2	2.4	3.9	2.6	3.2	2.1	2.1	3.03	3.5	2.1	6.4
10	COD mg/l	10	-	18	20	25	9	-	27	50	-	-	-
11	Chloride mg/l	8805.7	54057.7	121.9	154	195	4529.2	730	7547.6	9497.06	19463.82	10320	11251.83
12	Fecal Coliform MPN/100 ml	230	130	7900	3300	2300	1300	230	230	130	170	490	230
13	Total Coliform MPN/100 ml	330	230	17000	4900	4900	1700	490	330	170	220	790	490

14	Ammonia mg/l	0.043	0.37	0.788	0.06	0.03	0.23	0.15	0.263	0.822	0.117	0.1	1.55
15	Total Dissolved Solids(mg/l)	14566	25542	302	471	400	1099	2123	11900	307	26948	26170	14349
16	Total Fixed Solids (mg/l)	16268	18127	120	47	50	469	1395	8053	14519	-	18562	-
17	Total Suspend-ed Solid (mg/l)	60	53	23	28	25	15	15	64	8	14	174	278
18	Hardness(mg/l)	4200	1600	56	4000	82	2500	1600	3600	3000	10000	3900	3800
19	Fluoride(mg/l)	0.66	6.73	0.6	0.26	1.52	0.27	1.5	0.02	3.93	1.26	0.4	-
20	Boron(mg/l)	22.12	4.88	1.9	4.6	4.4	2.2	2.4	-	-	-	-	-
21	Sulphate (mg/l)	771.8	81.48	24.6	61	136	194.8	131	137.32	1080.72	2212.77	2172	1159.52
22	Total Alkalinity(mg/l)	104	74	10	7	14	10	91	78	92	100	118	92
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	12
24	Sodium(mg/l)	2831	2157	58.8	69.8	102.9	89.4	370.5	2612	928	1112	4998	2602
25	Potassium(mg/l)	121.6	99.2	7.7	9.9	6.2	4.1	13.9	95.4	169.2	177.9	178.1	220.8
26	Calcium as CaCO3(mg/l)	400	800	34	600	20	1500	64	2000	480	4000	600	520
27	Magnesium(mg/l)	923.4	194.4	5.35	826	15.01	243	373	388.8	612.36	1458	802	797

RIVER SAL AT KHAREBAND, MARGAO 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	Sample not collected as it was in accessible	Sample not collected as it was in accessible	6.88	6.84	7.26	7.12	6.4	6.55	6.52	6.55	6.7	8
2	Temperature °C			29	28	28.6	30	30	30.7	28	26	28	31
3	Conductivity µs/cm			116.5	159.1	116.36	145.26	-	7619	449.2	539.2	777.8	386.7
4	Dissolved Oxygen mg/l			2.9	2.9	4.5	3.3	3.5	6.2	-	7.2	0.7	1.3
5	Turbidity (NTU)			55.4	22.6	10.14	14.82	9.32	20.2	32.5	17.84	17.89	3.23

6	Nitrite Nitrogen mg/l	eDio		0.035	0.04	0.03	0.004	0.004	4.2	4.644	0.372	0.01	0.002
7	Nitrogen(Nitrate) mg/l			0.3	0.094	0.12	1.06	1.1	0.23	12.26	-	0.09	3.06
8	Phosphate mg/l			0.105	0.06	0.05	0.05	0.03	0.021	0.105	1.034	0.04	0.01
9	BOD mg/l			10	2.2	1.1	1.7	1.3	8.9	7.41	4.2	6	1.3
10	COD mg/l			26	26	30	10	10	26	37	15	21	6
11	Chloride mg/l			12.14	10	20	20.06	16	34.99	59.96	197.1	155	26
12	Fecal Coliform MPN/100 ml			24000	13000	24000	54000	35000	54000	54000	54000	54000	24000
13	Total Coliform MPN/100 ml			35000	17000	35000	92000	54000	92000	92000	92000	92000	35000
14	Ammonia mg/l			0.746	0.1	0.16	0.43	0.16	1.694	0.753	0.017	5.16	2.16
15	Total Dissolved Solids(mg/l)			60	266	260	66	67	1145	1506	-	616	316
16	Total Fixed Solids (mg/l)			24	125	115	38	94	545	1538	1323	232	-
17	Total Suspended Solid (mg/l)			102	40	41	6	6	25	76	51	29	21
18	Hardness(mg/l)			34	2000	30	56	600	200	200	460	66	70
19	Fluoride(mg/l)			0.59	0.28	1.46	0.35	1.5	0.01	1.19	0.13	0.09	-
20	Boron(mg/l)			0.64	1.4	1.2	0.81	1.1	-	-	-	-	-
21	Sulphate (mg/l)			26.16	10.6	15.61	24.4	16.2	16.26	164.39	26.76	36.24	5.66
22	Total Alkalinity(mg/l)			10	6	12	6	56	70	62	74	90	56
23	Phenolphthelein Alkalinity(mg/l)			0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)			6.7	9.9	10.6	12.1	14	36.7	69.5	71.6	106.4	52.7
25	Potassium(mg/l)			5.3	3.7	3	2.1	3.5	5	46.2	6	6.6	4.4
26	Calcium as CaCO3(mg/l)			24	800	26	22	20	38	40	140	50	40
27	Magnesium(mg/l)			2.43	291.6	0.97	8.7	141	39.36	38.88	77.76	12	7

RIVER TIRACOL AT KERI, PERNEM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.73	7.91	8.25	5.61	6.41	7.19	7.79	7.86	8.06	7.81	7.77	8.08
2	Temperature ˚C	32.2	31	30	27.4	26	28	26	28	29	28	29	29
3	Conductivity µs/cm	53970	82720	66450	9319	14890	24220	56440	46450	81030	87510	64790	52090
4	Dissolved Oxygen mg/l	6	6.1	7.2	6.9	7.1	6.9	6.1	5.9	4.1	5.8	6	6.4
5	Turbidity (NTU)	7.89	7.73	17.59	16.6	6.91	4.9	3.3	3.5	2.21	3.49	2.72	2.64
6	Nitrite Nitrogen mg/l	0.002	0.009	0.002	0.01	0.008	0.004	0.001	0.002	0.008	0.005	0.006	0.005
7	Nitrogen(Nitrate) mg/l	0.05	0.013	0.01	0.523	0.19	0.16	0.005	0.02	0.11	0.147	0.17	0.2
8	Phosphate mg/l	0.02	0.04	0.13	0.016	0.003	0.003	0.055	0.072	0.06	0.028	0.011	0.04
9	BOD mg/l	1.7	3.6	2.3	2.4	1	3.6	0.9	3.5	2.1	2.9	3	2.9
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	25641	27440	23243	2413.8	4177	8872.2	18212	18455	18369	19427	20993	25492
12	Fecal Coliform MPN/100 ml	33	490	130	790	1300	790	230	240	240	23	33	33
13	Total Coliform MPN/100 ml	79	1300	220	1700	3500	1700	330	540	540	33	49	46
14	Ammonia mg/l	0.014	0.22	0.002	0.492	0.07	0.14	0.03	0.2	0.12	0.02	0.11	BDL
15	Total Dissolved Solids(mg/l)	39018	41090	49620	5482	11436	16762	33204	33291	52095	41668	71469	43950
16	Total Fixed Solids (mg/l)	28614	32594	38752	3874	9590	12230	27873	31375	18662	32721	51870	30779
17	Total Suspended Solid (mg/l)	91	104	199	59	59	34	168	78	197	198	168	212
18	Hardness(mg/l)	7600	7500	5800	810	1780	2600	6240	2720	7400	7800	8400	10000
19	Fluoride(mg/l)	0.904	1.33	1.44	0.524	1.05	0.9	0.41	1.32	1.8	3.25	0.99	BDL
20	Boron(mg/l)	4.58	3.15	0.9	0.5	2.88	2.3	2.22	-	-	-	-	-
21	Sulphate (mg/l)	2389	2455	2013	239.4	511	382.5	2844	3811	2788	2257	2474	3009

22	Total Alkalinity(mg/l)	56	86	12	12	16	120	118	120	152	120	134	126
23	Phenolphthalein Alkalinity(mg/l)	0	4	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	9088	9088	10088	986.1	2264	3018	1605	8198	1494	1474	6854	6118
25	Potassium(mg/l)	204.1	285	284.4	54.3	92.4	134.7	234.7	232.2	212	211.6	275.1	301
26	Calcium as CaCO3(mg/l)	1800	1400	3000	142	260	600	1120	1400	1800	1200	1400	1800
27	Magnesium(mg/l)	1409	1482	686	162.3	369	486	1244	320.8	1361	1604	1701	1993

RIVER CHAPORA NEAR SIOLIM BRIDGE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.57	7.6	7.76	5.97	6.65	7.28	7.82	7.81	7.81	7.93	8.01	8.09
2	Temperature ˚C	33.9	30.4	32.1	28.7	26.3	28.3	27	27	28	28	29.6	29.5
3	Conductivity µs/cm	32700	52010	46450	2759	7070	5390	48830	43300	66950	81420	32170	52380
4	Dissolved Oxygen mg/l	5.3	6.1	4	6.8	6.9	7.6	6.1	5.6	5	5.2	7.2	6.2
5	Turbidity (NTU)	6.25	2.75	6.9	23.3	8.33	11.8	1.89	2.72	1.25	2.28	3.23	2.73
6	Nitrite Nitrogen mg/l	0.004	0.02	0.003	0.037	0.006	0.004	0.001	0.002	0.008	0.003	0.003	0.004
7	Nitrogen(Nitrate) mg/l	0.04	0.002	0.005	0.508	0.13	0.15	0.06	0.02	0.09	0.136	0.12	0.13
8	Phosphate mg/l	0.03	0.01	0.03	0.022	0.006	0.034	0.11	0.048	0.03	0.02	0.004	0.005
9	BOD mg/l	2.1	2.1	1.4	1.4	0.9	1.7	1.2	2.4	1	1.8	5.2	2.7
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	14564	13599	18119	684.8	2331	6248.1	16027	15784	18744	19669	11746	25742
12	Fecal Coliform MPN/100 ml	1300	1300	1300	7900	7900	7900	1300	7900	2300	4900	780	450
13	Total Coliform MPN/100 ml	3300	2300	2200	17000	13000	13000	2300	1300	3300	7900	1100	780

14	Ammonia mg/l	0.038	0.16	0.002	0.323	0.08	0.11	0.01	0.15	0.04	0.03	0.09	BDL
15	Total Dissolved Solids(mg/l)	27561	27045	30911	1690	5557	2930	39508	30094	39476	42811	35091	45721
16	Total Fixed Solids (mg/l)	17498	15927	17890	1268	4862	2521	33028	19091	11863	28112	27807	32411
17	Total Suspend-ed Solid (mg/l)	101	79	107	52	54	37	207	215	206	208	182	158
18	Hardness(mg/l)	3600	4640	3000	270	780	2600	5700	5900	7000	6800	4400	9400
19	Fluoride(mg/l)	0.836	1.05	1.09	0.343	0.6	1.3	0.79	1.43	1.79	2.84	1.15	BDL
20	Boron(mg/l)	3.2	2	0.7	0.985	1.64	1.7	2.55	-	-	-	-	-
21	Sulphate (mg/l)	1615	1440	1630	94.05	259	170	2668.6	3322	4734	1926	1250	2822
22	Total Alkalinity(mg/l)	46	114	13	8	14	98	106	106	128	106	110	124
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	6	0	0
24	Sodium(mg/l)	5396	5554	6793	329.8	1049	674.3	1505	6848	1391	1422	3929	5769
25	Potassium(mg/l)	138.5	196.6	222.4	17.3	44	35	219	212	198	204.4	164.5	316.2
26	Calcium as CaCO3(mg/l)	800	880	1000	48	180	400	1100	1200	1400	1400	400	1800
27	Magnesium(mg/l)	608	914	486	54	146	534.6	1118	1142	1361	1312	972	1847

RIVER SINQUERIM, CANDOLIM SIDE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.3	7.5	7.97	6.16	6.61	7.14	7.6	7.72	7.99	7.75	8.03	8
2	Temperature ˚C	33.1	31	31	28.2	26.8	28.7	27	29	27	28.5	30	28
3	Conductivity µs/cm	53710	84000	67600	5320	19980	34650	43810	45490	71070	79480	55910	51310

4	Dissolved Oxygen mg/l	4.4	5.3	5.9	6.5	5.9	6.8	5.6	5.1	4.5	5.2	5.7	6.8
5	Turbidity (NTU)	3.78	10.3	25.6	22.6	6.71	5.83	3.21	2.5	3.74	3.53	7.42	4.81
6	Nitrite Nitrogen mg/l	0.003	0.002	0.003	0.396	0.011	0.004	0.003	0.002	0.015	0.009	0.006	0.005
7	Nitrogen(Nitrate) mg/l	0.04	0.005	0.006	0.579	0.25	0.19	0.03	0.02	0.08	0.158	0.16	0.14
8	Phosphate mg/l	0.03	0.03	0.02	0.009	0.02	0.34	0.05	0.068	0.04	0.035	0.004	0.03
9	BOD mg/l	1.5	1.8	1.9	1.8	0.9	2.3	1.4	2.2	1.2	1.9	2.4	2.8
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	24641	27926	27991	1340.4	6022	12996	13356	17970	21893	21855	21743	20993
12	Fecal Coliform MPN/100 ml	450	3300	780	4600	4900	1300	780	2300	780	2400	230	790
13	Total Coliform MPN/100 ml	780	4900	1700	7000	7900	2300	2300	3300	1300	3500	310	1300
14	Ammonia mg/l	0.008	0.12	0.001	0.38	0.127	0.13	0.11	0.1	0.09	0.01	0.14	BDL
15	Total Dissolved Solids(mg/l)	41146	41709	49026	3616	14320	24417	29790	34243	44762	42398	76054	50875
16	Total Fixed Solids (mg/l)	30462	34215	38399	2624	12573	18495	23876	29555	13587	32787	48639	32175
17	Total Suspended Solid (mg/l)	950	107	117	45	128	5	200	64	241	214	238	183
18	Hardness(mg/l)	13000	6800	6400	450	2360	4000	5000	6000	7600	6400	8800	14200
19	Fluoride(mg/l)	0.948	1.38	1.27	0.505	1.04	1.05	0.68	1.4	1.5	3.48	1.23	BDL
20	Boron(mg/l)	3.7	2.66	1.1	0.615	3.48	3.8	0.04	-	-	-	-	-
21	Sulphate (mg/l)	2081	2717	2877	51.3	797	901	2319	3034	6670	2334	3468	3290
22	Total Alkalinity(mg/l)	54	126	16	12	20	140	98	118	138	118	138	130
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	9471	9006	9561	602.2	3002	4467	1400	7641	1461	1474	7473	6499
25	Potassium(mg/l)	200.6	291	288.4	32.9	125.1	183.3	206	219.6	209	210.4	254.7	309

26	Calcium as CaCO3(mg/l)	1400	1100	1200	90	400	1000	800	900	1400	1400	1400	2600
27	Magnesium(mg/l)	2819	1385	1264	87.5	476	729	1020	1239	1507	1215	1798	2819

RIVER SINQUERIM, NEAR GANPATI TEMPLE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.37	7.6	8.03	6.16	6.69	7.19	7.6	7.67	7.86	7.68	7.71	7.97
2	Temperature ˚C	32.3	31	31.2	28.4	26.9	28.9	27	28	28	28	30	28
3	Conductivity µs/cm	53630	83420	67210	5350	27570	39120	47470	45690	79340	83240	56110	51780
4	Dissolved Oxygen mg/l	4.3	5.7	6	6.5	5.8	5.9	7.6	4.6	4.5	5.1	5.7	6.2
5	Turbidity (NTU)	6.42	13.96	30.9	26	9.56	7.5	3.92	5.41	3.54	4.47	8.7	6.91
6	Nitrite Nitrogen mg/l	0.003	0.003	0.002	0.605	0.012	0.004	0.004	0.015	0.015	0.01	0.007	0.005
7	Nitrogen(Nitrate) mg/l	0.04	0.022	0.018	0.443	0.26	0.2	0.05	0.04	0.1	0.187	0.16	0.14
8	Phosphate mg/l	0.1	0.06	0.02	0.011	0.02	0.36	0.23	0.082	0.15	0.033	0.006	0.01
9	BOD mg/l	1.1	2.4	1.7	2.1	1.9	1.9	1.4	1.5	1.1	2.1	2.6	1.7
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	23616	23069	24242	1316.2	8499	16370	15541	17483	21118	21612	22368	20743
12	Fecal Coliform MPN/100 ml	1300	1300	450	4900	7000	4900	450	4900	1300	3500	130	1300
13	Total Coliform MPN/100 ml	2300	1700	780	7900	11000	7900	1300	7900	2300	5400	170	2200
14	Ammonia mg/l	0.011	0.08	0.002	0.206	0.09	0.16	0.07	0.14	0.12	0.07	0.18	0.2
15	Total Dissolved Solids(mg/l)	40199	42349	48459	3633	17846	38088	32754	35524	45111	40841	58727	49944
16	Total Fixed Solids (mg/l)	30110	34151	37658	2424	16706	17875	22617	29305	13889	31505	47000	32078
17	Total Suspended Solid (mg/l)	98	163	126	53	139	21	175	171	225	196	237	153

18	Hardness(mg/l)	7600	6900	6200	442	3200	4600	5500	5800	9800	7800	6600	8400
19	Fluoride(mg/l)	0.944	1.06	1.24	0.481	0.49	2.25	0.42	0.55	1.7	0.63	1.17	BDL
20	Boron(mg/l)	3.82	3.08	0.8	0.765	3.8	3.6	BDL	-	-	-	-	-
21	Sulphate (mg/l)	2705	2317	2124	39.9	1130	433.5	2208	3023	3884	2281	2873	2958
22	Total Alkalinity(mg/l)	61	118	12	10	24	148	110	116	148	116	138	130
23	Phenolphthalein Alkalinity(mg/l)	0	6	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	10094	9125	9579	569.6	4289	5120	1469	7564	1452	1470	7139	6291
25	Potassium(mg/l)	204.8	288	285	32.5	168	203.4	215	222.4	207	209.2	256.8	315.5
26	Calcium as CaCO3(mg/l)	1400	1400	1600	82	540	1200	1000	1100	1600	1200	1800	1800
27	Magnesium(mg/l)	1507	1336	1118	87.5	646	826	1093	1142	1993	1604	1166	1604

RIVER MANDOVI AT IFFI JETTY 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.33	7.3	7.3	7.31	6.21	7.52	7.7	7.85	7.78	7.7	8.1	7.88
2	Temperature ˚C	31.3	30.5	30.5	26.9	28.7	29	30	28	30.5	27.3	29	32
3	Conductivity µs/cm	52460	62920	62920	15620	489.8	50870	46930	69790	74910	57110	51270	48100
4	Dissolved Oxygen mg/l	5.7	6.3	6.3	7.1	5.81	5.8	6.8	6.1	5.9	5.9	5.5	6.6
5	Turbidity (NTU)	5.22	23.7	23.7	26.4	15.97	5.81	3.94	1.74	3.14	7.48	6.48	10.29
6	Nitrite Nitrogen mg/l	0.005	0.002	0.005	0.014	0.01	0.005	0.004	0.002	0.005	0.03	0.007	0.005
7	Nitrogen(Nitrate) mg/l	0.007	0.02	0.03	0.28	0.29	0.32	0.38	0.26	0.19	0.2	0.04	0.04
8	Phosphate mg/l	0.03	0.028	0.027	0.028	0.022	0.08	0.05	0.07	0.036	0.02	0.04	0.02
9	BOD mg/l	1.3	3.4	3.6	1.5	2.2	2.2	1.7	2.7	1.9	3.1	0.9	4
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	22341	26367	27991	4380	8747	26617	25562	25090	23971.3	19368	25742	26491

12	Fecal Coliform MPN/100 ml	490	490	330	3500	4900	4900	2300	780	490	1700	790	790
13	Total Coliform MPN/100 ml	790	790	490	9200	9400	7900	4900	1700	790	2200	1300	1100
14	Ammonia mg/l	0.01	0.03	0.05	0.07	0.25	0.06	0.006	0.1	0.08	0.004	0.03	BDL
15	Total Dissolved Solids(mg/l)	41956	34856	11250	11728	12775	14698	49082	12886	45999	51925	28856	29928
16	Total Fixed Solids (mg/l)	31523	23040	7119	7085	7862	9244	27131	8210	33975	30124	18360	-
17	Total Suspend-ed Solid (mg/l)	118	132	230	248	52	48	150	112	72	177	191	198
18	Hardness(mg/l)	7400	5340	5130	1400	2000	4000	11800	6600	9500	9000	6000	11200
19	Fluoride(mg/l)	1.84	1	1.1	0.79	1.2	1.9	1.8	2.2	3.25	1.8	1	BDL
20	Boron(mg/l)	2.85	2.36	1.9	1.7	1.5	1.3	1.2	-	2.84	-	-	-
21	Sulphate (mg/l)	3351	6316	2465	520.7	931.6	1436.5	1314	1418	1842.7	2380	3291	2788
22	Total Alkalinity(mg/l)	146	760	56	14	16	146	148	124	108	124	128	128
23	Phenolphthalein Alkalinity(mg/l)	0	6	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	7816	8792	8743	1898	2508	7320	6616	7468	1031	1233	6498	5697
25	Potassium(mg/l)	293	279.6	327.8	97.5	104	252.5	179.2	209.3	190.3	197.8	270.8	304.7
26	Calcium as CaCO3(mg/l)	1100	1280	2500	230	1200	1400	6400	3200	1900	2000	1400	2000
27	Magnesium(mg/l)	1531	986	639	284.3	194.4	631.8	1312	826	1846.8	1701	1118	2236

RIVER MANDOVI NEAR HOTEL MARIOTT 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.66	7.57	7.57	7.15	5.96	7.55	7.76	7.78	7.75	7.81	8.08	7.82
2	Temperature ˚C	31.1	30.5	30.5	27.2	28.4	29	30	28	30.5	27.1	29	32

3	Conductivity µs/cm	52150	63330	63330	14780	479.2	50500	51120	66430	78030	51040	51140	48690
4	Dissolved Oxygen mg/l	5.7	6	6	7.2	6.91	6.9	6.6	5.3	5.1	6.2	5.7	6.8
5	Turbidity (NTU)	7.57	25.5	25.5	16.04	18.45	6.91	6.19	3.07	2.62	8.84	6.95	8.76
6	Nitrite Nitrogen mg/l	0.002	0.006	0.006	0.007	0.01	6.005	0.004	0.002	0.006	0.03	0.01	0.005
7	Nitrogen(Nitrate) mg/l	0.03	0.05	0.06	0.26	0.28	0.29	0.3	0.28	0.15	0.18	0.04	0.03
8	Phosphate mg/l	0.03	0.031	0.032	0.029	0.024	0.05	0.04	0.07	0.021	0.03	0.04	0.02
9	BOD mg/l	1.5	2.6	2.6	1.6	1.3	1.3	1.6	2.1	2.1	3.4	1.1	3.6
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	20398	23743	23493	4672	8747	16245	15264	15114	27395.8	22493	22493	21868
12	Fecal Coliform MPN/100 ml	2400	78	490	2400	2300	1300	130	130	1300	3500	2400	2400
13	Total Coliform MPN/100 ml	5400	170	790	5400	3300	2300	230	230	3500	5400	5400	3500
14	Ammonia mg/l	0.03	0.1	0.1	0.05	0.2	0.04	0.004	0.04	0.05	0.008	0.09	BDL
15	Total Dissolved Solids(mg/l)	38657	34362	11235	12344	13040	15288	57174	13080	46900	54413	28562	29184
16	Total Fixed Solids (mg/l)	31139	22221	7120	7537	8865	9764	31137	8946	26758	28193	18221	-
17	Total Suspended Solid (mg/l)	131	150	320	342	40	42	319	174	101	199	190	180
18	Hardness(mg/l)	6300	5260	4920	1490	2400	5000	7400	6400	10200	7800	8600	13000
19	Fluoride(mg/l)	0.96	0.98	0.95	0.72	0.78	1.4	1.5	1.7	2.02	1.6	0.98	BDL
20	Boron(mg/l)	2.33	2.38	2	1.64	1.24	1.1	1.1	-	2.59	-	-	-
21	Sulphate (mg/l)	3163	7042	1595	543.1	816	1861.5	1621.1	1582	2056	3137	3497	4352
22	Total Alkalinity(mg/l)	134	780	56	10	18	160	134	134	114	116	128	120
23	Phenolphthalein Alkalinity(mg/l)	0	4	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	7883	8799	7297	1959	2415	66.6	7402	7642	1021	1240	6927	5736

25	Potassium(mg/l)	3274	283.1	295.1	102.5	102	250.5	190.8	212.3	196.2	199.5	251.3	326.9
26	Calcium as CaCO3(mg/l)	2500	1220	2000	280	600	1000	1400	1600	1600	1400	1400	2200
27	Magnesium(mg/l)	923	981.7	710	294	437.4	972	1458	1166	2089.8	1555	1750	2624

RIVER MANDOVI AT AMONA 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.73	7.11	6.88	6.93	6.08	6.97	6.94	7.04	7.09	6.91	7.35	7.28
2	Temperature ˚C	28.5	32.2	30.1	27.3	25.9	26.9	28	29	29	25.3	29	30
3	Conductivity µs/cm	37140	60550	49730	176.2	82.39	-	209.61	9216	20120	36430	28200	29770
4	Dissolved Oxygen mg/l	5	4.8	4.8	7.1	7.4	7.6	7.9	6.7	5.7	5.7	6	5.4
5	Turbidity (NTU)	8.08	3.79	2.86	27.5	25.9	2.53	26.7	13.21	10.47	11.26	10.08	13.66
6	Nitrite Nitrogen mg/l	0.08	0.083	0.06	0.01	0.014	0.003	0.004	0.01	0.01	0.15	0.14	0.17
7	Nitrogen(Nitrate) mg/l	0.76	0.08	0.07	0.05	0.05	0.04	0.012	0.018	0.11	0.16	0.14	0.25
8	Phosphate mg/l	0.03	0.01	0.04	0.02	0.014	0.04	0.003	0.07	0.06	0.02	0.01	0.02
9	BOD mg/l	0.9	1.2	1.3	1.3	0.6	1.7	2.2	6.2	1.1	1.7	2	1
10	COD mg/l	-	-	-	9	9	8	7	-	-	-	-	-
11	Chloride mg/l	16633.1	15152.75	21368	95	20	1374.6	35.9	4190	8247	7631.7	12246	9956
12	Fecal Coliform MPN/100 ml	790	230	1300	1300	5400	4900	3300	7900	4900	1700	3500	780
13	Total Coliform MPN/100 ml	1300	330	3500	3500	9200	7900	7000	11000	7900	3500	5400	1400
14	Ammonia mg/l	0.76	0.01	0.004	0.1	0.26	0.06	0.036	0.01	0.12	0.118	0.02	0.2
15	Total Dissolved Solids(mg/l)	29642	35535	36695	894	800	6792	153	1434	9247	19982	23127	22896

16	Total Fixed Solids (mg/l)	20688	23415	18310	456	400	4212	71	1869	953	11658	12888	-
17	Total Suspend-ed Solid (mg/l)	5	13	10	15	20	13	41	13	42	73	70	135
18	Hardness(mg/l)	6000	6000	3200	30	20	600	34	1600	1000	1000	4800	3600
19	Fluoride(mg/l)	1.32	1.63	1.18	0.23	0.85	0.8	0.89	0.98	1.1	2.55	0.22	2.72
20	Boron(mg/l)	-	1.15	1.3	0.67	0.62	0.59	BDL	-	-	-	-	-
21	Sulphate (mg/l)	1525.2	2057.51	2161	2448	11.4	1190	15.43	425	552	542.7	1148	564
22	Total Alkalinity(mg/l)	94	94	14	5	12	74	40	52	70	70	94	78
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	2
24	Sodium(mg/l)	5281	6630	7538	13.2	9.3	237.6	31.5	386.7	671	865	3765	3665
25	Potassium(mg/l)	160	220	236.6	3	3.2	10	3.2	12.3	80.7	118.5	159.4	174.4
26	Calcium as CaCO3(mg/l)	1500	820	1400	16	16	400	12	1000	600	800	1000	600
27	Magnesium(mg/l)	1093.5	1258.74	437	3.4	1	48.6	5.35	145.8	97	48.6	923	729

RAIA LAKE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.82	Sample not collected as it was in accessible	6.8	7.48	7.8	6.37	6.34	7.22	6.54	6.5	6.5	6.77
2	Temperature ˚C	28.7		31.3	30.3	30	31	29	30	29.1	26.5	26.4	31.5
3	Conductivity µs/cm	147.3		203.6	114.3	72.8	84.13	-	104.3	117.3	155.6	129.2	128.45
4	Dissolved Oxygen mg/l	7.9		8.2	7.5	7.4	4.2	3	5	5.9	8.2	7.3	6.5
5	Turbidity (NTU)	18.8		33.8	1.83	1.31	2.08	1.48	2.74	4.02	3.73	1.1	12.88
6	Nitrite Nitrogen mg/l	0.04		0.045	0.165	0.006	BDL	0.003	0.001	0.002	0.004	0.002	0.03
7	Nitrogen(Nitrate) mg/l	0.01		0.697	0.17	0.26	0.168	0.18	0.01	0.08	0.03	0.16	0.01
8	Phosphate mg/l	0.01		0.085	0.01	0.2	0.01	0.003	0.02	0.01	0.027	0.02	0.02
9	BOD mg/l	3.4		2.8	2.1	1	1.1	1.5	1.4	3	3	0.6	4.5
10	COD mg/l	40		25	26	10	2	3.1	7	6	10	3	25
11	Chloride mg/l	20.1		29.14	11.74	9	6.5	6.2	11.6	15.17	17	7	19
12	Fecal Coliform MPN/100 ml	490		1300	780	790	780	3500	3300	2400	1300	230	780
13	Total Coliform MPN/100 ml	1100		2200	1100	1400	1100	9200	7900	5400	2400	490	1300
14	Ammonia mg/l	0.01		7.08	0.028	0.09	BDL	0.04	0.14	0.09	0.085	0.02	0.3
15	Total Dissolved Solids(mg/l)	138		152	85	41	63	175	69	70	83	59	60
16	Total Fixed Solids (mg/l)	60		45	45	31	17	229	23	28	69	22	-
17	Total Suspended Solid (mg/l)	1		17	15	4	4	11	9	32	4	6	118
18	Hardness(mg/l)	34		34	400	10	24	22	28	32	32	60	26
19	Fluoride(mg/l)	0.2		0.42	0.07	0.72	0.6	0.82	BDL	0.07	0.72	BDL	BDL
20	Boron(mg/l)	-		0.281	BDL	1.76	0.06	0.07	-	-	-	-	-
21	Sulphate (mg/l)	8.1		31.12	4.7	6.35	3.31	2.7	1.27	5.4	10.3	4.82	5.7
22	Total Alkalinity(mg/l)	38		10	10	4	34	62	12	30	48	58	34
23	Phenolphthalein Alkalinity(mg/l)	0		0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	18.6		12.9	6.1	6.3	15.1	8.5	11.9	11.7	12.5	5.2	16.7
25	Potassium(mg/l)	1.1		13.7	4.4	2.6	5.8	3.2	3.5	3.4	1.9	1.8	4.2
26	Calcium as CaCO3(mg/l)	20		14	240	4	10	14	12	16	14	32	14
27	Magnesium(mg/l)	3.4		4.86	38.88	1.5	3.4	1.9	3.89	4	4.4	7	2.9

SAIPEM LAKE, NAVELIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	Sample not collected as it was inaccesible	Sample not collected as it was dry	7.03	7.67	6.26	Sample not collected as there was no flow of water	6.54	6.71	6.64	6.45	6.55	7.76
2	Temperature ˚C			28.7	27.5	30		30	30.06	29	26	27	30
3	Conductivity µs/cm			303.2	298.2	277.98		-	-	385	413.4	418.1	308.5
4	Dissolved Oxygen mg/l			3.9	5.7	2.1		1.2	7.8	0.37	-	0	0
5	Turbidity (NTU)			45	52.4	32		14.83	14.14	37.1	2.17	16.98	10.5
6	Nitrite Nitrogen mg/l			0.304	0.09	0.11		-	0.138	5.676	0.456	0.01	0.013
7	Nitrogen(Nitrate) mg/l			0.11	0.04	0.12		0.15	26.99	16.02	9.31	2.24	6.16
8	Phosphate mg/l			0.117	0.03	0.11		0.2	0.037	0.487	0.734	0.73	0.04
9	BOD mg/l			3.7	1.4	4		3	8	23	7	8	7
10	COD mg/l			45	35	32		10	22	38	10	28	31
11	Chloride mg/l			25.3	25	25		28	49.98	199.94	54.2	48	41.09
12	Fecal Coliform MPN/100 ml			54000	54000	54000		-	54000	54000	54000	54000	54000
13	Total Coliform MPN/100 ml			92000	92000	92000		-	92000	92000	92000	92000	92000
14	Ammonia mg/l			2.916	1	1.5		0.22	1.9	0.789	0.039	11.04	0.02
15	Total Dissolved Solids(mg/l)			180	1662	1562		133	1031	778	344	255	214
16	Total Fixed Solids (mg/l)			102	368	70		60	452	599	565	186	-
17	Total Suspended Solid (mg/l)			166	79	78		20	28	64	58	23	56
18	Hardness(mg/l)			100	94	74		62	1200	600	74	32	62
19	Fluoride(mg/l)			0.66	0.2	0.62		0.8	0.01	1.79	1.13	0.1	-
20	Boron(mg/l)			0.6	1.7	1.5		1.4	-	-	-	-	-
21	Sulphate (mg/l)			38	26	26.2		12.8	111.89	16.92	10.72	101.64	7.87
22	Total Alkalinity(mg/l)			16	12	16		126	90	102	80	106	50
23	Phenolphthalein Alkalinity(mg/l)			0	0	0		0	0	0	0	0	0
24	Sodium(mg/l)			16.7	18.9	19.4		22.2	33.7	82.3	47.6	47.3	37.2
25	Potassium(mg/l)			7	7.1	5.1		4.3	5.3	47.7	7.6	8.8	5.9
26	Calcium as CaCO3(mg/l)			80	78	12		50	38	42	60	16	42
27	Magnesium(mg/l)			4.86	3.9	15.1		2.9	282.3	135.594	3.402	4	4.86

CURTORIM LAKE, CURTORIM 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.1	8.72	6.8	7.34	7.9	6.59	6.76	7.04	6.96	7.2	6.8	6.7
2	Temperature ˚C	29.2	32.6	30.3	30.2	29.8	30	28	32	29	26	27	30.3
3	Conductivity µs/cm	154.1	190.7	231.7	140.4	92.3	109.01	-	22.4	157.4	180.2	256.6	399.36
4	Dissolved Oxygen mg/l	7.9	2.3	6.3	5.8	3.6	3.5	2.5	1.9	14.7	4.8	6.4	3.4
5	Turbidity (NTU)	31.5	8.16	17.55	42.8	18.43	16.45	15.34	23.8	51	0.29	23.9	40.4
6	Nitrite Nitrogen mg/l	0.01	0.009	0.008	0.137	0.003	0.002	0.002	0.018	0.013	0.004	0.006	0.008
7	Nitrogen(Nitrate) mg/l	0.03	0.21	0.211	0.05	0.04	0.05	0.07	0.01	0.09	0.01	0.008	0.009
8	Phosphate mg/l	0.05	0.017	0.007	0.02	0.08	0.013	0.003	0.05	0.01	0.023	0.06	0.02
9	BOD mg/l	8	0.7	2.4	1.9	0.9	0.7	2	4.8	16	3.9	4.8	-
10	COD mg/l	56	22	23	19	12	2	3.3	13	20	13	22	20
11	Chloride mg/l	16.1	13.75	28.65	12.72	9.5	10.1	11	29.6	15.17	25	46	32
12	Fecal Coliform MPN/100 ml	1300	450	1300	780	1300	780	1700	3300	7900	780	130	7900
13	Total Coliform MPN/100 ml	2300	780	3300	1300	2300	1300	2100	7900	11000	1300	230	13000
14	Ammonia mg/l	0.12	0.81	0.45	0.15	0.06	0.041	0.01	0.02	2.35	0.064	2.59	BDL
15	Total Dissolved Solids(mg/l)	144	50	150	81	50	80	1000	143	88	101	179	131
16	Total Fixed Solids (mg/l)	51	16	20	41	45	54	542	118	58	84	75	-
17	Total Suspended Solid (mg/l)	3	13	8	59	16	80	21	30	53	12	31	45
18	Hardness(mg/l)	28	88	48	600	8	28	80	48	52	46	60	50
19	Fluoride(mg/l)	0.14	0.17	0.31	BDL	0.73	0.013	0.84	BDL	0.55	0.73	BDL	BDL
20	Boron(mg/l)	1.4	0.14	0.78	1.59	1.16	0.02	0.03	-	-	-	-	-
21	Sulphate (mg/l)	16.8	206	32.11	12.88	3.67	5.62	3.4	1.9	1318	8.74	16.21	12.7
22	Total Alkalinity(mg/l)	24	28	10	12	6	40	84	14	38	148	48	70
23	Phenolphthalein Alkalinity(mg/l)	0	0	2	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	14.3	35.8	11.6	6.8	7.6	26.1	9.4	14.2	13.5	17	33.4	25.6
25	Potassium(mg/l)	2.3	5.5	18.9	3.5	2.5	15.5	4.5	6.1	4.8	4.2	5.2	5.8
26	Calcium as CaCO3(mg/l)	18	18	30	320	4	12	20	24	26	20	26	24
27	Magnesium(mg/l)	2.43	17	4.37	68.04	1	3.888	14.6	5.83	6.32	6.3	8	6.3

RIVER ZUARI AT MADKAI JETTY 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.04	7.53	8.01	-	7.18	7.22	7.16	7.47	7.53	7.38	7.79	7.68
2	Temperature ˚C	32.4	32	31	28	28	29.5	29	30	30	29	31	32.5
3	Conductivity µs/cm	4200	78600	61890	13910	13680	33560	-	71420	73530	75840	48330	46760
4	Dissolved Oxygen mg/l	5.7	4.8	5.3	6	6.7	4.8	6.5	6	5.5	5.2	5.4	5.6
5	Turbidity (NTU)	14.92	4.11	40	35.9	17.61	15.56	10.66	8.22	10.98	6.51	47.2	23.5
6	Nitrite Nitrogen mg/l	0.009	0.006	0.019	0.11	0.007	0.008	0.01	0.065	0.006	0.06	0.016	0.01
7	Nitrogen(Nitrate) mg/l	0.055	0.15	0.04	0.025	0.31	0.069	0.1	0.007	0.46	0.51	0.6	0.25
8	Phosphate mg/l	0.02	0.027	0.1	0.11	0.033	0.09	0.02	0.05	0.03	0.05	0.03	0.11
9	BOD mg/l	1.5	0.9	1.7	1.6	1.7	1.5	3.1	2.4	2.7	2.3	1.3	1.2
10	COD mg/l	BDL	-	-	15	18	-	-	-	-	-	-	-
11	Chloride mg/l	17241.1	20994	18698.1	405	47.93	11655	6995.7	21525.24	18345.4	23367	18923	23493
12	Fecal Coliform MPN/100 ml	790	78	790	2200	1300	780	450	130	490	130	490	790
13	Total Coliform MPN/100 ml	1100	130	1700	3400	1700	1300	780	230	700	170	940	1300
14	Ammonia mg/l	0.001	0.05	0.03	0.14	0.034	0.58	BDL	0.17	0.03	0.027	0.009	0.02
15	Total Dissolved Solids(mg/l)	33676	22164	35896	8369	8651	23888.4	13553	39696	55086	63880	43049	25950
16	Total Fixed Solids (mg/l)	-	18014	24660	7006	7041	20110	9813	27594	28650	27717	29086	16750
17	Total Suspended Solid (mg/l)	161	190	33	141	137	238	48	35	179	200	235	194
18	Hardness(mg/l)	6000	7200	6040	2400	1800	4020	3000	6000	7800	5200	3800	6200
19	Fluoride(mg/l)	1.84	101	1.76	0.9	1.27	BDL	0.73	0.98	1.41	2.8	1.41	-
20	Boron(mg/l)	-	0.93	N.R	0.48	3.16	-	-	-	-	-	-	-
21	Sulphate (mg/l)	2588.6	2464	3186	360.4	541.2	1090.4	1313.3	2738.12	2272.8	3392	2560	2085
22	Total Alkalinity(mg/l)	0.1	112	28	20	12	84	60	36	106	118	128	92
23	Phenolphthalein Alkalinity(mg/l)	124	0	2	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	2665.2	8843	7679	4.8	1835	4433	2534	6947	6852	1393	6374	6681
25	Potassium(mg/l)	313.4	270.5	313.8	2.2	79.5	180.2	90.4	235.5	229.1	200.5	249.1	251
26	Calcium as CaCO3(mg/l)	-	1400	1080	800	600	620	400	3200	1400	3200	1400	960
27	Magnesium(mg/l)	1166.4	1409	1205.28	389	291.6	826.2	631.8	680.4	1555.2	486	583	1273

RIVER ZUARI AT BORIM BRIDGE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.33	7.03	7.47	-	7.33	6.98	6.75	7.04	7.07	7.18	7.36	7.31
2	Temperature ˚C	33.8	32	30	27.6	27.5	29.1	28	30	30	30	32	32
3	Conductivity µs/cm	50700	46720	47600	228.2	277.4	14140	-	31510	38190	58190	33450	32550
4	Dissolved Oxygen mg/l	6	5.8	4.1	6.1	6.8	6	6.3	6.5	5.9	5	5.4	6.2
5	Turbidity (NTU)	25.3	16.87	33	33.7	20.1	0.86	9.5	5.13	7.15	4.14	12.09	14.7
6	Nitrite Nitrogen mg/l	0.011	0.018	0.002	0.004	0.006	0.004	0.003	0.065	0.002	0.03	0.04	0.01
7	Nitrogen(Nitrate) mg/l	0.038	0.03	0.19	0.26	0.19	0.063	0.1	0.06	0.68	0.06	0.76	0.06
8	Phosphate mg/l	0.015	0.022	0.21	0.014	0.017	0.018	0.004	0.03	0.1	0.03	0.02	0.04
9	BOD mg/l	1.7	2.5	1.8	1.4	1.6	1	1.7	3.1	1.4	1.8	2.6	1.9
10	COD mg/l	BDL	-	-	18	24	-	-	-	-	-	-	-
11	Chloride mg/l	11413.1	11496	13841.45	750	63.6	4176.7	3766.9	7020.16	8756.9	16369	25604	18244
12	Fecal Coliform MPN/100 ml	2300	1300	4900	4900	7900	3300	1300	780	3500	230	3500	230
13	Total Coliform MPN/100 ml	4900	1700	7900	7900	11000	4900	2300	1300	5400	330	5400	790
14	Ammonia mg/l	0.001	0.02	0.01	0.03	0.022	0.04	0.02	0.28	0.03	0.001	0.12	0.003
15	Total Dissolved Solids(mg/l)	35490	16562	28084	341	162	9510	6703	17091	27551	25162	30714	17929
16	Total Fixed Solids (mg/l)	-	14621	12625	200	53	6900	4953	8289	15107	9342	19354	6377
17	Total Suspended Solid (mg/l)	119	62	15	38	34	64	44	15	104	115	142	131
18	Hardness(mg/l)	6500	2980	4480	32	34	1640	1400	2800	3800	2600	5800	4020
19	Fluoride(mg/l)	1.28	0.9	1.14	0.9	0.51	0.41	0.49	0.63	1.13	1.7	1.63	-
20	Boron(mg/l)	1.56	0.56	1.38	1.1	1.06	1.81	-	-	-	-	-	-
21	Sulphate (mg/l)	1405.4	1470	2114.7	0.3	7.5	557.6	1714.7	678.74	841.35	1717	1940	1542.4
22	Total Alkalinity(mg/l)	106.3	48	36	14	6	48	42	38	82	94	104	100
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	16515	5005	6065	23.6	38.5	1865	1286	2720	3515	1208	4463	3511
25	Potassium(mg/l)	103.9	178.7	249.7	4.1	3.6	84.3	45.1	106	129.9	169	177.2	138.2
26	Calcium as CaCO3(mg/l)	-	800	300	10	8	232	400	400	600	2200	1000	620
27	Magnesium(mg/l)	1385.1	530	894.24	5.3	6.318	342.1	243	583.2	777.6	97.2	1166	826.2

CARAMBOLIM LAKE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.51	Sample not collected as it was in accessible		7.05	5.87	6.6	6.76	6.7	6.44	6.44	7.25	6.5
2	Temperature ˚C	27.7			27.2	28.1	28.4	29	29	29	23.3	29	29
3	Conductivity µs/cm	69.72			145.7	110.52	164.03	158.52	126.5	155.4	195.2	63.1	221.7
4	Dissolved Oxygen mg/l	6.4			6.2	6.4	1.4	4.6	2.9	4.6	4	3.6	3.4
5	Turbidity (NTU)	9.02			27.9	10.69	3.86	3.71	3.32	2.29	4.78	5.56	10.49
6	Nitrite Nitrogen mg/l	0.004			0.03	0.011	0.006	0.001	0.002	0.03	0.01	0.005	0.16
7	Nitrogen(Nitrate) mg/l	0.01			0.03	0.02	0.02	0.007	0.009	0.12	0.47	0.44	0.11
8	Phosphate mg/l	0.016			0.01	0.016	0.05	0.001	0.009	0.03	0.04	0.003	0.01
9	BOD mg/l	3.4			3	2	-	1.3	1.7	1.7	1	1.6	1.3
10	COD mg/l	22			11	5	7	10	-	12	2	7	-
11	Chloride mg/l	26.42			14	9	14.5	25.74	20	15.5	25.4	19	21.4
12	Fecal Coliform MPN/100 ml	230			780	1700	1300	790	5400	490	130	270	790
13	Total Coliform MPN/100 ml	460			1300	2200	2300	1700	9200	790	170	330	1100
14	Ammonia mg/l	0.01			0.02	0.11	0.05	0.098	0.06	0.08	0.127	0.09	0.28
15	Total Dissolved Solids(mg/l)	277			6.91	620	98	100	106	613	120	112	172
16	Total Fixed Solids (mg/l)	8			240	210	36	41	357	104	71	69	-
17	Total Suspended Solid (mg/l)	4			30	40	20	4	4	12	20	18	19
18	Hardness(mg/l)	64			30	40	52	46	48	30	54	64	64
19	Fluoride(mg/l)	0.12			0.25	1.08	1.8	BDL	2	0.49	0.43	0.22	0.02
20	Boron(mg/l)	0.04			0.43	0.48	0.5	0.109	-	-	-	-	-
21	Sulphate (mg/l)	158.5			1861.5	7.4	2.45	4.6	0.7	4.2	2.82	3.1	0.97
22	Total Alkalinity(mg/l)	70			8	8	96	64	60	66	58	78	60
23	Phenolphthalein Alkalinity(mg/l)	0			0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	19.5			6.2	7.2	9.3	15.4	7.6	14.4	16	16.2	18.9
25	Potassium(mg/l)	1.9			2.8	2.8	2.6	5.4	3.3	1.8	2.1	2	3.6
26	Calcium as CaCO3(mg/l)	50			28	28	44	36	36	20	34	40	46
27	Magnesium(mg/l)	3.4			0.5	2.9	1.04	2.43	2.9	2.4	4.86	5.8	4

ANJUNEM LAKE 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.51	7.81	9.41	6.12	6.21	6.85	6.84	7.53	6.9	6.22	7.55	7.66
2	Temperature ˚C	31	28	30.1	26	25.4	28.4	26	28	27	28	29.5	28
3	Conductivity µs/cm	38.87	38.6	82.58	101.7	50.06	82.39	63.3	54.92	52.48	52.24	54.9	71.68
4	Dissolved Oxygen mg/l	7.4	6.8	6.6	7.3	7.4	7.9	7.8	8.3	8.2	6.1	7.2	7.3
5	Turbidity (NTU)	0.79	2.05	5.77	4.27	2.02	1.33	2.41	1.09	0.87	1.14	1.24	4.5
6	Nitrite Nitrogen mg/l	0.005	0.001	0.001	0.005	0.005	0.002	0.003	0.005	0.001	0.001	0.001	0.001
7	Nitrogen(Nitrate) mg/l	0.048	0.03	0.17	0.12	0.11	0.37	0.39	0.04	0.28	0.02	0.012	0.01
8	Phosphate mg/l	0.012	0.009	0.01	0.005	0.015	0.004	0.003	0.024	0.002	0.005	0.002	0.01
9	BOD mg/l	0.3	1	0.8	1.5	0.5	0.3	0.4	1.3	1.5	1.1	0.8	1.1
10	COD mg/l	13	2	10	6	17	10	10	23	10	9	1	-
11	Chloride mg/l	8	9.5	10.27	6.85	5.34	13.5	14.2	13.21	7	9.71	2.91	9.2
12	Fecal Coliform MPN/100 ml	2	4.5	23	7.8	79	49	22	2	-	-	NIL	49
13	Total Coliform MPN/100 ml	6.8	11	79	33	240	130	49	7.8	4.5	2	4.5	130
14	Ammonia mg/l	0.079	0.03	0.04	0.04	0.029	0.17	0.18	0.08	BDL	BDL	0.02	0.03
15	Total Dissolved Solids(mg/l)	22	25	52	63	34	52	56	36	-	42	32	46
16	Total Fixed Solids (mg/l)	12	16	24	16	9	44	38	19	-	20	9	-
17	Total Suspended Solid (mg/l)	6	8	24	20	4	5	5	10	-	2	4	8
18	Hardness(mg/l)	26	58	40	48	12	20	18	26	28	16	62	26
19	Fluoride(mg/l)	0.13	0.1	0	BDL	0.713	BDL	0.02	0.88	0.2	BDL	0.59	0.1
20	Boron(mg/l)	2.05	0.16	0.08	0.92	BDL	1.82	1.81	21.14	-	-	-	-
21	Sulphate (mg/l)	1.7	2.7	3.04	6.12	0.48	3.27	3.2	2.13	2.5	1.33	3.75	2.06
22	Total Alkalinity(mg/l)	280	24	22	8	18	26	24	20	54	12	22	24
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	0	0	0	0
24	Sodium(mg/l)	9.1	1.1	8.2	7.6	4.9	3.6	3.4	44.1	5.9	4.3	3.4	7.2
25	Potassium(mg/l)	6.4	2	2.2	2.6	2.4	2.2	2.1	40.4	0.6	0.4	0.1	2.1
26	Calcium as CaCO3(mg/l)	22	22	14	24	8	10	11	14	18	10	16	16
27	Magnesium(mg/l)	1	8.8	6.3	5.8	0.972	2.4	2	2.9	2.4	8.01	11.2	2

RIVER MANDOVI AT RIBANDAR-CHODAN FERRY, PANAJI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	7.14	4.4	7.97	7.1	6.43	6.94	6.74	7.65	-	-	7.53	7.83
2	Temperature ˚C	31	31	30.6	29.1	28.5	32	30	30	-	-	29	31
3	Conductivity µs/cm	46600	74460	63020	699	5247	6892	7723	7210	-	-	43050	47800
4	Dissolved Oxygen mg/l	5.3	4.6	6.1	6.5	6.5	7.5	7.4	4.5	-	-	6.1	5.5
5	Turbidity (NTU)	81.9	4.001	5.04	24.4	42.6	9.21	10.02	3.85	-	-	6.55	7.83
6	Nitrite Nitrogen mg/l	0.011	0.004	0.003	0.01	0.005	0.003	0.004	0.004	-	-	0.005	0.006
7	Nitrogen(Nitrate) mg/l	0.08	0.049	0.02	0.56	0.23	0.21	0.19	0.1	-	-	0.12	0.15
8	Phosphate mg/l	0.03	0.053	0.01	0.05	0.01	0.015	0.02	0.04	-	-	0.01	0.05
9	BOD mg/l	2.4	0.9	2.5	1.5	0.7	1.2	1.2	2.4	-	-	1.7	3.3
10	COD mg/l	-	-	-	-	-	-	-	-	-	-	-	-
11	Chloride mg/l	19216	17119.7	19764	1214	1516.55	1651	10204.92	10002.8	-	-	17619	20493
12	Fecal Coliform MPN/100 ml	790	130	230	3500	3500	3300	330	3300	-	-	490	1300
13	Total Coliform MPN/100 ml	1300	220	330	5400	5400	7000	790	7000	-	-	790	2400
14	Ammonia mg/l	0.097	0.067	0.05	0.17	0.01	0.2	0.06	0.04	-	-	0.12	BDL
15	Total Dissolved Solids(mg/l)	25541	39686	38697	469	3076	4336	5035	5978	-	-	37242	80471
16	Total Fixed Solids (mg/l)	14964	-	31950	303	1104	3058	3501	4066	-	-	24228	-
17	Total Suspended Solid (mg/l)	42	136	111	150	58	19	59	86	-	-	200	83
18	Hardness(mg/l)	6000	6500	3400	76	568	620	3260	4800	-	-	5400	7000
19	Fluoride(mg/l)	0.964	1.85	3.22	0.29	BDL	0.22	0.6	1.1	-	-	1.24	BDL
20	Boron(mg/l)	1.99	5.33	4.5	0.08	BDL	0.22	3.48	-	-	-	-	-
21	Sulphate (mg/l)	2028	3050.5	2445.3	65.09	262.28	221	938.42	2784.6	-	-	2168	3358
22	Total Alkalinity(mg/l)	55	104	24	10	46	56	88	114	-	-	114	116
23	Phenolphthalein Alkalinity(mg/l)	0	0	0	0	0	0	0	0	-	-	0	0
24	Sodium(mg/l)	8118	8047	8796	86.5	866.5	861	1182	5099	-	-	5259	5592
25	Potassium(mg/l)	184.3	263	264.6	6.7	34.9	42	173.3	158.6	-	-	203.2	280.4
26	Calcium as CaCO3(mg/l)	1000	1400	800	22	100	12	520	800	-	-	1200	1400
27	Magnesium(mg/l)	1215	1239.3	631.08	13.1	113.72	148	6145.82	972	-	-	1021	1361

DATA OF MICRO POLLUTANTS MONITORED BIANNUALLY (APRIL & OCTOBER) FOR 2016 - 2017

Sr. No	Parameters	RIVER CHAPORA NEAR ALORNA FORT, PERNEM		RIVER KALNA AT CHANDEL, PERNEM		RIVER MAPUSA ON CULVERT ON HIGHWAY MAPU-SA-PANAJI		RIVER ASSANORA AT ASSANORA		RIVER VALVANTI AT SANQUELIM		RIVER MADEI AT DABOSE, VALPOI		RIVER KHANDE-PAR, OPA, PONDA	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	0.009	0.512	0.008	-	0.329	-	ND	ND	ND	0.009	ND	ND	ND	-
2	Copper(mg/l)	0.025	0.032	0.018	-	0.04	-	0.073	ND	0.073	0.009	0.081	0.002	0.083	-
3	Chromium(mg/l)	ND	0.004	ND	-	0.088	-	0.049	ND	ND	ND	ND	0.004	ND	-
4	Cadmium(mg/l)	ND	0.214	ND	-	0.041	-	0.021	ND	ND	ND	ND	ND	ND	-
5	Zinc(mg/l)	0.03	0.815	0.04	-	0.065	-	0.061	0.318	0.038	0.217	0.127	0.147	0.079	-
6	Lead(mg/l)	0.128	0.112	ND	-	0.29	-	ND	ND	ND	ND	ND	ND	BDL	-
7	Iron(mg/l)	0.482	0.917	0.418	-	0.252	-	0.491	0.314	0.457	0.412	0.325	0.314	0.356	-
8	Manganese (mg/l)	0.8	0.356	0.033	-	0.195	-	0.251	0.004	0.185	0.018	0.09	0.005	0.197	-
9	Cobalt (mg/l)	ND	ND	ND	-	0.228	-	ND	0.005	ND	ND	ND	ND	ND	-
10	Alpha BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
11	Beta BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
12	Gamma BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
13	Aldrin (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
14	Dieldrin (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
15	O,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
16	P,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
17	Alpha endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
18	-endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
19	carboryl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
20	Anilofos (mg/l)	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-
21	Parathion methyl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
22	Malathion (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
23	Chloropylos (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-

Sr. No	Parameters	RIVER KHANDEPAR AT CODLI		RIVER KUSHAWATI NEAR BUND AT KEVONA, RIVONA, SANGUEM		RIVER TALPONA AT CANACONA		RIVER SAL AT PAZORCONI, CUNCOLIM		RIVER SAL AT MOBOR		HARWALE WATERFALL		RIVER BICHOLIM, BARAZAN NAGAR, BICHOLIM	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	ND	-	ND	0.012	ND	ND	0.017	-	0.828	0.612	ND	ND	0.023	0.012
2	Copper(mg/l)	0.083	-	0.045	0.001	0.062	ND	0.086	-	0.179	0.017	0.078	0.001	0.025	0.051
3	Chromium(mg/l)	0.083	-	ND	ND	ND	ND	0.035	-	0.116	ND	ND	ND	ND	ND
4	Cadmium(mg/l)	ND	-	0.017	ND	ND	ND	0.02	-	0.128	0.512	ND	ND	0.015	0.004
5	Zinc(mg/l)	0.073	-	0.077	0.412	0.152	0.172	0.133	-	0.137	0.012	0.023	0.512	0.123	0.19
6	Lead(mg/l)	ND	-	ND	ND	ND	ND	ND	-	0.978	0.081	ND	ND	ND	0.009
7	Iron(mg/l)	0.349	-	0.602	0.31	1.305	0.72	0.739	-	11.5	4.712	0.341	0.741	0.631	0.712
8	Manganese (mg/l)	0.175	-	0.907	0.01	1.508	0.002	0.056	-	0.282	0.312	0.068	0.149	0.455	0.247
9	Cobalt (mg/l)	ND	-	ND	ND	ND	0.009	ND	-	0.715	ND	ND	ND	ND	0.009
10	Alpha BHC (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
11	Beta BHC (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
12	Gamma BHC (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
13	Aldrin (mg/l)	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
14	Dieldrin (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
15	O,P-DDT (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
16	P,P-DDT (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
17	Alpha endosulphane (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
18	-endosulphane (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
19	carboryl (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
20	Anilofos (mg/l)	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Parathion methyl (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
22	Malathion (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
23	Chloropylos (mg/l)	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

DATA OF MICRO POLLUTANTS MONITORED BIANNUALLY (APRIL & OCTOBER) FOR 2016 - 2017

Sr. No	Parameters	MAYEM LAKE AT MAYEM		CUMBHARJUA CANAL, CORLIM		RIVER ZUARI AT PANCHAWADI		RIVER ZUARI AT CORTALIM		CREEK AT DANDO MOLLO, VELSAO, MORMUGAO		RIVER MANDOVI NEAR MANDOVI BRIDGE, PANAJI		RIVER MANDOVI AT TONCA MARCELA	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	0.169	ND	0.989	0.607	0.329	-	0.875	0.001	0.04	0.219	0.708	-	0.664	0.612
2	Copper(mg/l)	0.027	0.012	0.21	0.027	0.129	-	0.128	0.062	0.064	0.007	0.105	-	0.119	0.054
3	Chromium(mg/l)	ND	ND	0.199	0.007	0.152	-	0.129	ND	0.024	ND	0.179	-	0.154	ND
4	Cadmium(mg/l)	0.016	ND	0.153	0.121	0.064	-	0.136	0.014	0.016	0.141	0.084	-	0.085	0.172
5	Zinc(mg/l)	0.124	0.31	0.253	0.317	0.136	-	0.188	0.117	0.053	0.812	0.123	-	0.126	0.192
6	Lead(mg/l)	ND	ND	1.06	0.012	0.244	-	0.989	0.312	ND	ND	0.599	-	0.678	0.217
7	Iron(mg/l)	3.215	0.112	1.02	0.617	10.36	-	1.072	0.718	0.333	0.774	0.196	-	2.35	1.198
8	Manganese (mg/l)	0.278	0.021	1.749	0.491	0.37	-	0.305	0.412	0.135	0.179	0.115	-	0.111	0.471
9	Cobalt (mg/l)	ND	ND	0.875	ND	0.157	-	ND	0.001	ND	ND	0.461	-	0.526	ND
10	Alpha BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
11	Beta BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
12	Gamma BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
13	Aldrin (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
14	Dieldrin (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
15	O,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
16	P,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
17	Alpha endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
18	b-endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
19	carboryl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
20	Anilofos (mg/l)	<0.04	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Parathion methyl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
22	Malathion (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
23	Chloropylos (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

DATA OF MICRO POLLUTANTS MONITORED BIANNUALLY (APRIL & OCTOBER) FOR 2016 - 2017

Sr. No	Parameters	RIVER SELAULIM LAKE AT SELAULIM, SANGUEM		AGRICULTURAL CANAL UP-STREAM OF CUNCOLIM INDUSTRIAL ESTATE		AGRICULTURAL CANAL DOWN-STREAM OF CUNCOLIM INDUSTRIAL ESTATE		RUMDER LAKE, NUVEM		RIVER SAL AT ORLIM BRIDGE		RIVER SAL AT KHAREBAND, MARGAO		RIVER TIRACOL AT KERI, PERNEM	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	ND	ND	0.048	-	0.018	ND	0.03	0.432	0.47	0.307	-	0.532	0.761	0.013
2	Copper(mg/l)	0.035	ND	0.067	-	0.073	ND	0.048	0.012	0.124	0.052	-	0.027	0.155	0.009
3	Chromium(mg/l)	ND	ND	0.042	-	0.04	ND	ND	ND	0.098	ND	-	0.002	0.205	ND
4	Cadmium(mg/l)	0.009	ND	ND	-	0.02	ND	0.017	0.314	0.072	0.121	-	0.007	0.18	0.013
5	Zinc(mg/l)	0.113	0.212	0.149	-	0.053	0.541	0.081	0.017	0.161	0.092	-	0.114	0.182	0.108
6	Lead(mg/l)	ND	ND	ND	-	ND	ND	ND	0.079	6.576	0.009	-	0.312	1.309	0.009
7	Iron(mg/l)	0.61	0.104	1.016	-	0.255	0.912	2.991	1.413	1.914	2.145	-	0.918	0.809	2.142
8	Manganese (mg/l)	0.119	0.004	0.236	-	0.17	0.004	2.769	0.149	0.53	0.407	-	0.012	0.251	0.089
9	Cobalt (mg/l)	ND	ND	ND	-	ND	0.002	ND	ND	0.362	ND	-	-	0.812	ND
10	Alpha BHC (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
11	Beta BHC (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
12	Gamma BHC (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
13	Aldrin (mg/l)	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010
14	Dieldrin (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
15	O,P-DDT (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
16	P,P-DDT (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
17	Alpha endosulphane (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
18	-endosulphane (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
19	carboryl (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
20	Anilofos (mg/l)	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04
21	Parathion methyl (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
22	Malathion (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005
23	Chloropylos (mg/l)	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005

DATA OF MICRO POLLUTANTS MONITORED BIANNUALLY (APRIL & OCTOBER) FOR 2016 - 2017

Sr. No	Parameters	RIVER CHAPORA NEAR SIOLIM BRIDGE		RIVER SINQUER-IM, CANDOLIM SIDE		RIVER SINQUERIM, NEAR GANPATI TEMPLE		RIVER MANDOVI AT IFFI JETTY		RIVER MANDOVI NEAR HOTEL MARIOTT		RIVER MANDOVI AT AMONA		RAIA LAKE	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	0.452	0.004	0.457	0.714	0.999	0.012	0.436	0.512	0.476	0.004	0.494	ND	ND	0.004
2	Copper(mg/l)	0.07	0.017	0.096	0.007	0.128	0.012	0.4	0.021	0.134	0.051	0.117	0.045	0.04	0.017
3	Chromium(mg/l)	0.123	0.007	0.128	ND	0.262	ND	0.191	ND	0.369	ND	0.133	ND	ND	ND
4	Cadmium(mg/l)	0.076	0.007	0.057	0.021	0.24	0.012	0.088	0.312	0.081	0.012	0.078	0.017	0.016	0.002
5	Zinc(mg/l)	0.099	0.166	0.125	0.11	0.164	0.192	0.106	0.512	0.101	0.012	0.162	0.921	0.11	0.009
6	Lead(mg/l)	0.231	0.009	0.563	0.014	1.306	0.412	0.649	0.312	0.449	0.417	0.576	ND	ND	0.002
7	Iron(mg/l)	0.866	1.712	1.533	2.012	0.667	0.912	12.48	1.042	1.328	0.876	1.619	1.719	1.994	0.012
8	Manganese (mg/l)	0.122	0.017	0.13	0.074	0.279	0.007	0.162	0.121	0.144	0.712	0.31	0.152	1.266	0.146
9	Cobalt (mg/l)	0.301	0.007	0.376	ND	1.175	0.007	0.58	0.012	0.369	0.007	0.534	ND	ND	0.01
10	Alpha BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
11	Beta BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
12	Gamma BHC (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
13	Aldrin (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
14	Dieldrin (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
15	O,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
16	P,P-DDT (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
17	Alpha endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
18	-endosulphane (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
19	carboryl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
20	Anilofos (mg/l)	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Parathion methyl (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
22	Malathion (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
23	Chloropylos (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

DATA OF MICRO POLLUTANTS MONITORED BIANNUALLY (APRIL & OCTOBER) FOR 2016 - 2017

Sr. No	Parameters	SAIPEM LAKE, NAVELIM		CURTORIM LAKE, CURTORIM		RIVER ZUARI AT MADKAI JETTY		RIVER ZUARI AT BORIM BRIDGE		CARAMBOLIM LAKE		ANJUNEM LAKE		RIVER MANDOVI AT RIBANDAR-CHODAN FERRY, PANAJI	
		Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16	Apr-16	Oct-16
1	Nickel(mg/l)	-	0.212	0.032	ND	0.526	-	0.543	-	0.043	ND	ND	ND	0.871	-
2	Copper(mg/l)	-	0.009	0.039	0.034	0.245	-	0.177	-	0.024	0.047	0.079	0.009	0.127	-
3	Chromium(mg/l)	-	ND	ND	ND	0.213	-	0.188	-	0.027	ND	ND	ND	0.11	-
4	Cadmium(mg/l)	-	0.012	0.019	ND	0.09	-	0.09	-	0.019	ND	ND	ND	0.112	-
5	Zinc(mg/l)	-	0.172	0.163	0.317	0.142	-	0.128	-	0.138	0.242	0.043	0.217	0.122	-
6	Lead(mg/l)	-	ND	ND	ND	0.669	-	0.546	-	ND	ND	ND	ND	0.776	-
7	Iron(mg/l)	-	0.912	0.185	0.258	1.277	-	6.562	-	1.46	0.412	0.125	0.124	2.096	-
8	Manganese (mg/l)	-	0.112	0.072	0.125	0.191	-	0.379	-	0.247	0.071	0.522	0.009	0.4	-
9	Cobalt (mg/l)	-	ND	0.522	ND	0.841	-	0.381	-	ND	0.001	ND	ND	0.673	-
10	Alpha BHC (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
11	Beta BHC (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
12	Gamma BHC (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
13	Aldrin (mg/l)	-	<0.010	<0.010	<0.010	<0.010	-	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
14	Dieldrin (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
15	O,P-DDT (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
16	P,P-DDT (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
17	Alpha endosulphane (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
18	-endosulphane (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
19	carboryl (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
20	Anilofos (mg/l)	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Parathion methyl (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
22	Malathion (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
23	Chloropylos (mg/l)	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

INLET SAMPLE TO STP AT TONCA, PANAJI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.65	5.8	5.8	6.47	6.46	6.56	6.25	6.66	6.85	6.28	7.11	6.2
2	BOD mg/l	440	256	240	100	100	110	100	120	294.1	250	140	320
3	COD mg/l	880	800	650	340	350	420	380	540	740	620	583	450
4	Total Suspended Solid (mg/l)	75	119	119	437	250	298	171	1635	525	500	214	120

OUTLET SAMPLE TO STP AT TONCA, PANAJI 2016-2017

Sr. No	Parameters	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
1	pH	6.92	6.8	6.8	6.88	6.54	7.37	7.22	6.55	7.1	7.19	6.71	6.86
2	BOD mg/l	4	6	8	6	8	8	18	20	18.07	18	10	12
3	COD mg/l	20	20	20	40	40	38	70	90	60	17	14	20
4	Total Suspended Solid (mg/l)	5	7	7	14	8	9	56	44	36	22	7	7

BOREWELL/TUBE WELL/ OPEN WELL IN ZUARI INDUSTRIES LTD, ZUARINAGAR 2016-2017				
Sr. No	Parameters	Apr-16	Oct-16	Limit for class A as per CPCB classification based on designated best use
1	pH	Sample not collected as well was dismantled	Sample not collected as well was dismantled	6.5-8.5
2	Temperature ˚C			
3	Conductivity µs/cm			
4	Dissolved Oxygen mg/l			6 mg/l or more
5	Turbidity (NTU)			
6	Nitrite Nitrogen mg/l			
7	Nitrogen(Nitrate) mg/l			
8	Phosphate mg/l			
9	BOD mg/l			2 mg/l or less
10	COD mg/l			
11	Chloride mg/l			
12	Fecal Coliform MPN/100 ml			
13	Total Coliform MPN/100 ml			50 or less MPN/100 ml
14	Ammonia mg/l			
15	Total Dissolved Solids(mg/l)			
16	Total Fixed Solids (mg/l)			
17	Total Suspended Solid (mg/l)			
18	Hardness(mg/l)			
19	Fluoride(mg/l)			
20	Boron(mg/l)			
21	Sulphate (mg/l)			
22	Total Alkalinity(mg/l)			
23	Phenolphthalein Alkalinity(mg/l)			
24	Sodium(mg/l)			
25	Potassium(mg/l)			
26	Calcium as CaCO3(mg/l)			
27	Magnesium(mg/l)			
28	Nickel(mg/l)			
29	Copper(mg/l)			
30	Chromium(mg/l)			
31	Cadmium(mg/l)			
32	Zinc(mg/l)			
33	Lead(mg/l)			
34	Iron(mg/l)			
35	Manganese (mg/l)			
36	Cobalt (mg/l)			
37	Alpha BHC (mg/l)			
38	Beta BHC (mg/l)			
39	Gamma BHC (mg/l)			
40	Aldrin (mg/l)			
41	Dieldrin (mg/l)			
42	O,P-DDT (mg/l)			
43	P,P-DDT (mg/l)			
44	Alpha endosulphane (mg/l)			
45	β-endosulphane (mg/l)			
46	carboryl (mg/l)			
47	Anilofos (mg/l)			
48	Parathion methyl (mg/l)			
49	Malathion (mg/l)			
50	Chloropylos (mg/l)			

BOREWELL/TUBE WELL/OPEN WELL AT SANCOALE INDUSTRIAL ESTATE 2016-2017				
Sr. No	Parameters	Apr-16	Oct-16	Limit for class A as per CPCB classification based on designated best use
1	pH	6.94	6.69	6.5-8.5
2	Temperature ˚C	29	27	
3	Conductivity µs/cm	64.33	2533	
4	Dissolved Oxygen mg/l	6.5	7.3	6 mg/l or more
5	Turbidity (NTU)	3.75	0.9	
6	Nitrite Nitrogen mg/l	0.001	0.004	
7	Nitrogen(Nitrate) mg/l	1.14	1.1	
8	Phosphate mg/l	0.009	0.003	
9	BOD mg/l	1.7	1.1	2 mg/l or less
10	COD mg/l	-	9	
11	Chloride mg/l	12.72	11	
12	Fecal Coliform MPN/100 ml	NIL	NIL	
13	Total Coliform MPN/100 ml	<18	13	50 or less MPN/100 ml
14	Ammonia mg/l	0.039	0.02	
15	Total Dissolved Solids(mg/l)	154	58	
16	Total Fixed Solids (mg/l)	87	30	
17	Total Suspended Solid (mg/l)	11	2	
18	Hardness(mg/l)	26	30	
19	Fluoride(mg/l)	0.05	-	
20	Boron(mg/l)	1.6	1.2	
21	Sulphate (mg/l)	1.43	0.95	
22	Total Alkalinity(mg/l)	26	78	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	8.6	4.4	
25	Potassium(mg/l)	8.6	3	
26	Calcium as CaCO3(mg/l)	12	18	
27	Magnesium(mg/l)	3.4	2.9	
28	Nickel(mg/l)	ND	0.142	
29	Copper(mg/l)	0.061	0.03	
30	Chromium(mg/l)	ND	0.001	
31	Cadmium(mg/l)	ND	0.172	
32	Zinc(mg/l)	0.276	0.187	
33	Lead(mg/l)	ND	0.172	
34	Iron(mg/l)	0.775	0.171	
35	Manganese (mg/l)	0.088	0.172	
36	Cobalt (mg/l)	ND	ND	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	

BOREWELL/TUBE WELL/ OPEN WELL AT VERNA INDUSTRIAL ESTATE 2016-2017				
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	7.5	6.7	6.5-8.5
2	Temperature ˚C	31.5	32	
3	Conductivity µs/cm	285.2	-	
4	Dissolved Oxygen mg/l	8.3	6.5	6 mg/l or more
5	Turbidity (NTU)	0.3	0.31	
6	Nitrite Nitrogen mg/l	0.06	0.003	
7	Nitrogen(Nitrate) mg/l	3.6	3.1	
8	Phosphate mg/l	0.01	0.003	
9	BOD mg/l	1.1	0.9	2 mg/l or less
10	COD mg/l	4	8	
11	Chloride mg/l	26.4	37.5	
12	Fecal Coliform MPN/100 ml	NIL	NIL	
13	Total Coliform MPN/100 ml	<18	6.8	50 or less MPN/100 ml
14	Ammonia mg/l	0.002	0.006	
15	Total Dissolved Solids(mg/l)	218	366	
16	Total Fixed Solids (mg/l)	126	398	
17	Total Suspended Solid (mg/l)	1	45	
18	Hardness(mg/l)	86	72	
19	Fluoride(mg/l)	0.09	0.52	
20	Boron(mg/l)	1.79	1.8	
21	Sulphate (mg/l)	21.8	35	
22	Total Alkalinity(mg/l)	58	118	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	19.5	26.6	
25	Potassium(mg/l)	6.6	3.5	
26	Calcium as CaCO3(mg/l)	44	44	
27	Magnesium(mg/l)	10.2	6.8	
28	Nickel(mg/l)	ND	ND	
29	Copper(mg/l)	0.039	0.012	
30	Chromium(mg/l)	ND	ND	
31	Cadmium(mg/l)	ND	ND	
32	Zinc(mg/l)	0.098	0.452	
33	Lead(mg/l)	ND	ND	
34	Iron(mg/l)	0.335	0.112	
35	Manganese (mg/l)	2.837	0.007	
36	Cobalt (mg/l)	ND	ND	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	

49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
BOREWELL/ TUBE WELL/ OPEN WELL KUNDAIM INDUSTRIAL ESTATE 2016-2017				
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	6.08	6.56	6.5-8.5
2	Temperature ˚C	31	29	
3	Conductivity µs/cm	33.75	-	
4	Dissolved Oxygen mg/l	4	2.7	6 mg/l or more
5	Turbidity (NTU)	2.29	19.67	
6	Nitrite Nitrogen mg/l	BDL	0.002	
7	Nitrogen(Nitrate) mg/l	0.4	0.09	
8	Phosphate mg/l	0.01	0.003	
9	BOD mg/l	0.6	0.6	2 mg/l or less
10	COD mg/l	2	10	
11	Chloride mg/l	16.51	9.5	
12	Fecal Coliform MPN/100 ml	NIL	NIL	
13	Total Coliform MPN/100 ml	<18	<1.8	50 or less MPN/100 ml
14	Ammonia mg/l	0.004	BDL	
15	Total Dissolved Solids(mg/l)	23	168	
16	Total Fixed Solids (mg/l)	13	14	
17	Total Suspended Solid (mg/l)	9	8	
18	Hardness(mg/l)	30	96	
19	Fluoride(mg/l)	0.01	-	
20	Boron(mg/l)	0.93	0.9	
21	Sulphate (mg/l)	5.58	26.5	
22	Total Alkalinity(mg/l)	46	124	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	11	7.7	
25	Potassium(mg/l)	2.4	4.8	
26	Calcium as CaCO3(mg/l)	16	66	
27	Magnesium(mg/l)	3	7.3	
28	Nickel(mg/l)	ND	ND	
29	Copper(mg/l)	0.048	0.005	
30	Chromium(mg/l)	ND	ND	
31	Cadmium(mg/l)	ND	ND	
32	Zinc(mg/l)	0.205	0.192	
33	Lead(mg/l)	ND	ND	
34	Iron(mg/l)	2.23	0.219	
35	Manganese (mg/l)	0.472	0.047	
36	Cobalt (mg/l)	ND	0.001	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	

46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
	BORE WELL/ TUBE WELL / OPENWELL IN CORLIM INDUSTRIAL ESTATE 2016-2017			
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	7.04	6.5	6.5-8.5
2	Temperature ˚C	29.9	31	
3	Conductivity µs/cm	22.53	-	
4	Dissolved Oxygen mg/l	7.2	4.8	6 mg/l or more
5	Turbidity (NTU)	0.61	0.15	
6	Nitrite Nitrogen mg/l	0.003	0.002	
7	Nitrogen(Nitrate) mg/l	0.41	0.51	
8	Phosphate mg/l	0.001	0.002	
9	BOD mg/l	0.5	0.3	2 mg/l or less
10	COD mg/l	3	10	
11	Chloride mg/l	14	15.5	
12	Fecal Coliform MPN/100 ml	13	NIL	
13	Total Coliform MPN/100 ml	170	<1.8	50 or less MPN/100 ml
14	Ammonia mg/l	0.04	0.002	
15	Total Dissolved Solids(mg/l)	14	1641	
16	Total Fixed Solids (mg/l)	6	1022	
17	Total Suspended Solid (mg/l)	3	7	
18	Hardness(mg/l)	16	14	
19	Fluoride(mg/l)	0.01	-	
20	Boron(mg/l)	0.92	0.9	
21	Sulphate (mg/l)	2.54	0.5	
22	Total Alkalinity(mg/l)	42	58	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	4.3	13.1	
25	Potassium(mg/l)	2.5	2.9	
26	Calcium as CaCO3(mg/l)	12	6	
27	Magnesium(mg/l)	1	2	
28	Nickel(mg/l)	ND	ND	
29	Copper(mg/l)	0.055	0.002	
30	Chromium(mg/l)	ND	ND	
31	Cadmium(mg/l)	ND	ND	
32	Zinc(mg/l)	0.204	0.412	
33	Lead(mg/l)	ND	ND	
34	Iron(mg/l)	0.355	0.169	
35	Manganese (mg/l)	0.102	0.009	
36	Cobalt (mg/l)	ND	ND	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	

43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
BOREWELL/TUBE WELL/OPEN WELL IN PILERNE INDUSTRIAL ESTATE 2016-2017				
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	6.86	7.11	6.5-8.5
2	Temperature ˚C	32.8	28	
3	Conductivity µs/cm	81.12	266.12	
4	Dissolved Oxygen mg/l	7.6	7	6 mg/l or more
5	Turbidity (NTU)	2.8	5.66	
6	Nitrite Nitrogen mg/l	0.001	0.002	
7	Nitrogen(Nitrate) mg/l	1	0.07	
8	Phosphate mg/l	0.02	0.03	
9	BOD mg/l	1.2	2.7	2 mg/l or less
10	COD mg/l	2	9	
11	Chloride mg/l	8	11	
12	Fecal Coliform MPN/100 ml	7.8	23	
13	Total Coliform MPN/100 ml	33	79	50 or less MPN/100 ml
14	Ammonia mg/l	0.011	0.03	
15	Total Dissolved Solids(mg/l)	84	204	
16	Total Fixed Solids (mg/l)	32	118	
17	Total Suspended Solid (mg/l)	12	44	
18	Hardness(mg/l)	102	88	
19	Fluoride(mg/l)	0.212	BDL	
20	Boron(mg/l)	0.72	BDL	
21	Sulphate (mg/l)	161	5	
22	Total Alkalinity(mg/l)	43	116	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	49.8	27.8	
25	Potassium(mg/l)	0.2	5	
26	Calcium as CaCO3(mg/l)	6	56	
27	Magnesium(mg/l)	10.2	7.78	
28	Nickel(mg/l)	0.054	ND	
29	Copper(mg/l)	0.022	0.019	
30	Chromium(mg/l)	ND	0.004	
31	Cadmium(mg/l)	ND	ND	
32	Zinc(mg/l)	1.777	0.172	
33	Lead(mg/l)	ND	ND	
34	Iron(mg/l)	0.71	0.214	
35	Manganese (mg/l)	0.308	0.092	
36	Cobalt (mg/l)	0.028	0.017	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	

41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
BORE WELL/TUBE WELL/ OPEN WELL IN CUNCOLIM INDUSTRIAL ESTATE 2016-2017				
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	6.72	6.7	6.5-8.5
2	Temperature ˚C	29	31	
3	Conductivity µs/cm	350.5	-	
4	Dissolved Oxygen mg/l	3.5	2.2	6 mg/l or more
5	Turbidity (NTU)	0.42	0.12	
6	Nitrite Nitrogen mg/l	0.01	0.002	
7	Nitrogen(Nitrate) mg/l	0.02	0.04	
8	Phosphate mg/l	0.01	0.015	
9	BOD mg/l	0.8	0.5	2 mg/l or less
10	COD mg/l	1	8	
11	Chloride mg/l	9.71	155	
12	Fecal Coliform MPN/100 ml	7.8	130	
13	Total Coliform MPN/100 ml	23	350	50 or less MPN/100 ml
14	Ammonia mg/l	BDL	0.1	
15	Total Dissolved Solids(mg/l)	207	8118	
16	Total Fixed Solids (mg/l)	94	7016	
17	Total Suspended Solid (mg/l)	8	49	
18	Hardness(mg/l)	128	142	
19	Fluoride(mg/l)	0.08	0.6	
20	Boron(mg/l)	0.9	0.45	
21	Sulphate (mg/l)	1.63	2.4	
22	Total Alkalinity(mg/l)	146	1620	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	9.3	7.3	
25	Potassium(mg/l)	2.1	4.1	
26	Calcium as CaCO3(mg/l)	74	76	
27	Magnesium(mg/l)	13.12	16	
28	Nickel(mg/l)	ND	ND	
29	Copper(mg/l)	0.087	ND	
30	Chromium(mg/l)	0.049	ND	
31	Cadmium(mg/l)	0.019	ND	
32	Zinc(mg/l)	0.282	0.781	
33	Lead(mg/l)	ND	ND	
34	Iron(mg/l)	0.582	0.41	
35	Manganese (mg/l)	0.251	0.01	
36	Cobalt (mg/l)	ND	ND	
37	Alpha BHC (mg/l)	<0.005	<0.005	

38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
	BOREWELL/TUBE WELL/OPEN WELL IN BETHORA INDUSTRIAL ESTATE 2016-2017			
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for class A as per CPCB classification based on designated best use**
1	pH	7.47	5.34	6.5-8.5
2	Temperature ˚C	29.7	28.5	
3	Conductivity µs/cm	108.8	-	
4	Dissolved Oxygen mg/l	4.41	4.7	6 mg/l or more
5	Turbidity (NTU)	0.64	0	
6	Nitrite Nitrogen mg/l	0.001	BDL	
7	Nitrogen(Nitrate) mg/l	1.87	3.21	
8	Phosphate mg/l	BDL	0.003	
9	BOD mg/l	0.5	0.2	2 mg/l or less
10	COD mg/l	BDL	8	
11	Chloride mg/l	10.7	18.1	
12	Fecal Coliform MPN/100 ml	NIL	NIL	
13	Total Coliform MPN/100 ml	<18	<1.8	50 or less MPN/100 ml
14	Ammonia mg/l	0.001	0.01	
15	Total Dissolved Solids(mg/l)	50.8	44	
16	Total Fixed Solids (mg/l)	-	25	
17	Total Suspended Solid (mg/l)	3	3	
18	Hardness(mg/l)	24	28	
19	Fluoride(mg/l)	BDL	BDL	
20	Boron(mg/l)	0.11	-	
21	Sulphate (mg/l)	0.914	0.5	
22	Total Alkalinity(mg/l)	30	14	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	7.5	5.7	
25	Potassium(mg/l)	0.1	2.8	
26	Calcium as CaCO3(mg/l)	8	10	
27	Magnesium(mg/l)	3.89	4.37	
28	Nickel(mg/l)	0.016	-	
29	Copper(mg/l)	0.096	-	
30	Chromium(mg/l)	ND	-	
31	Cadmium(mg/l)	ND	-	
32	Zinc(mg/l)	0.08	-	
33	Lead(mg/l)	ND	-	
34	Iron(mg/l)	0.281	-	

35	Manganese (mg/l)	0.132	-	
36	Cobalt (mg/l)	ND	-	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	
BOREWELL/ TUBEWELL/OPENWELL IN MADKAI INDUSTRIAL ESTATE 2016-2017				
Sr. No	**Parameters**	**Apr-16**	**Oct-16**	**Limit for Class A as per CPCB classification based on designated best use**
1	pH	6.94	5.48	6.5-8.5
2	Temperature ˚C	29	32	
3	Conductivity µs/cm	74.01	-	
4	Dissolved Oxygen mg/l	6.5	6.7	6 mg/l or more
5	Turbidity (NTU)	3.75	0	
6	Nitrite Nitrogen mg/l	0.001	BDL	
7	Nitrogen(Nitrate) mg/l	0.97	1.26	
8	Phosphate mg/l	BDL	0.003	
9	BOD mg/l	1.7	1.2	2 mg/l or less
10	COD mg/l	BDL	9	
11	Chloride mg/l	6.31	11.7	
12	Fecal Coliform MPN/100 ml	2	13	
13	Total Coliform MPN/100 ml	7.8	49	50 or less MPN/100 ml
14	Ammonia mg/l	BDL	BDL	
15	Total Dissolved Solids(mg/l)	41.6	40	
16	Total Fixed Solids (mg/l)	14	25	
17	Total Suspended Solid (mg/l)	14	2	
18	Hardness(mg/l)	12	22	
19	Fluoride(mg/l)	BDL	0.25	
20	Boron(mg/l)	0.96	-	
21	Sulphate (mg/l)	0.296	0.95	
22	Total Alkalinity(mg/l)	28	16	
23	Phenolphthalein Alkalinity(mg/l)	0	0	
24	Sodium(mg/l)	3.9	3.9	
25	Potassium(mg/l)	0.3	2.9	
26	Calcium as CaCO3(mg/l)	10	8	
27	Magnesium(mg/l)	0.49	3.4	
28	Nickel(mg/l)	0.024	-	
29	Copper(mg/l)	0.089	-	
30	Chromium(mg/l)	ND	-	
31	Cadmium(mg/l)	ND	-	

32	Zinc(mg/l)	0.048	-	
33	Lead(mg/l)	ND	-	
34	Iron(mg/l)	0.746	-	
35	Manganese (mg/l)	0.081	-	
36	Cobalt (mg/l)	ND	-	
37	Alpha BHC (mg/l)	<0.005	<0.005	
38	Beta BHC (mg/l)	<0.005	<0.005	
39	Gamma BHC (mg/l)	<0.005	<0.005	
40	Aldrin (mg/l)	<0.010	<0.010	
41	Dieldrin (mg/l)	<0.005	<0.005	
42	O,P-DDT (mg/l)	<0.005	<0.005	
43	P,P-DDT (mg/l)	<0.005	<0.005	
44	Alpha endosulphane (mg/l)	<0.005	<0.005	
45	β-endosulphane (mg/l)	<0.005	<0.005	
46	carboryl (mg/l)	<0.005	<0.005	
47	Anilofos (mg/l)	<0.04	<0.04	
48	Parathion methyl (mg/l)	<0.005	<0.005	
49	Malathion (mg/l)	<0.005	<0.005	
50	Chloropylos (mg/l)	<0.005	<0.005	

ANNEXYRE IV
Water Monitoring Data Pre and Post Ganesh Visarjan, 2016

River Mandovi at Ferry Point 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 10.45 am	16/09/2016 1.00 pm	23/09/2016 1.30 pm
2	Weather	Cloudy	Raining	Raining
3	Colour	Turbid	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	Ferry point	Ferry point	Ferry point
6	pH	7.07	7.42	6.8
7	Temperature °C	28	28	29
8	Cond ms/cm	7.17	44.45	10.07
9	Turb NTU	27.2	7.83	21.9
10	DO mg/l	6	4.4	4.2
11	BOD mg/l	1.8	2.5	0
12	COD mg/l	8	-	24
13	Total Dissolved Solids mg/l	4302	26225	6947
14	Total Solids mg/l	4901	28860	8646
15	Chromium mg/l	1.026	1.279	0.526
16	Lead mg/l	ND	0.102	ND
17	Zinc mg/l	0.36	0.144	0.302
18	Copper mg/l	0.009	0.124	0.077

River Mapusa at Taricode- Mapusa 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 11.05 am	16/09/2016 11.00 am	23/09/2016 11.35 am
2	Weather	Cloudy	Raining	Raining
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	6.98	6.93	6.62
7	Temperature °C	28	28	29
8	Cond ms/cm	0.248	1.341	0.476
9	Turb NTU	7.54	4.61	10.28
10	DO mg/l	2.6	3.3	3.1
11	BOD mg/l	1.4	1.4	2.6
12	COD mg/l	10	14	14
13	Total Dissolved Solids mg/l	148	318	300
14	Total Solids mg/l	175	376	364
15	Chromium mg/l	ND	ND	ND
16	Lead mg/l	ND	0.047	ND
17	Zinc mg/l	0.139	0.115	0.147
18	Copper mg/l	0.012	0.023	0.044

Carambolim Lake at Carambolim 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 10.45 am	16/09/2016 12.15 pm	23/09/2016 12.50 pm
2	Weather	Sunny	Cloudy	Drizzling
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	Construction	None	None
6	pH	6.72	6.56	6.5
7	Temperature °C	31	27	25.8
8	Cond µs/cm	130.87	167.9	148.98
9	Turb NTU	14.34	3.31	11.43
10	DO mg/l	5.8	1.7	3.6
11	BOD mg/l	5.3	0.4	2.2
12	COD mg/l	15	24	14
13	Total Dissolved Solids mg/l	30	110	59
14	Total Solids mg/l	59	184	76
15	Chromium mg/l	0.368	ND	ND
16	Lead mg/l	ND	ND	ND
17	Zinc mg/l	0.201	0.162	0.174
18	Copper mg/l	0.008	0.031	0.05

Carkhamba (Mansher) Panaji – St. Cruz road 2016

Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 10.30 am	16/09/2016 1.30 pm	23/09/2016 12.45 pm
2	Weather	Cloudy	Raining	Raining
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.54	7.02	7.16
7	Temperature °C	28	28	29
8	Cond ms/cm	4.66	4.919	17.98
9	Turb NTU	9.89	5.45	9.79
10	DO mg/l	5.5	4.6	4.9
11	BOD mg/l	0.8	1	1
12	COD mg/l	7	-	6
13	Total Dissolved Solids mg/l	2796	3344	12586
14	Total Solids mg/l	3602	3406	16512
15	Chromium mg/l	0.581	0.938	0.7
16	Lead mg/l	ND	0.009	0.426
17	Zinc mg/l	0.131	0.138	0.162
18	Copper mg/l	0.007	0.081	0.078

Near the bridge , Chereaband , Dandora, Cuncolim 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	29/08/2016 12.30 pm	19/09/2016 12.30 pm	26/09/2016 12.00 pm
2	Weather	Cloudy	Sunny	Sunny
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	6.87	6.7	6.45
7	Temperature °C	29	29	29
8	Cond µs/cm	63.19	83.58	128.16
9	Turb NTU	3.52	2.38	5.99
10	DO mg/l	7.1	7.7	5.9
11	BOD mg/l	0.8	1.3	1.4
12	COD mg/l	8	5	6
13	Total Dissolved Solids mg/l	35	45.97	70.49
14	Total Solids mg/l	55	50.14	76.89
15	Chromium mg/l	0.342	0.318	0.311
16	Lead mg/l	0.024	0.412	ND
17	Zinc mg/l	0.13	0.124	0.116
18	Copper mg/l	0.013	0.038	0.055

Near Railway bridge, Khandiwada , Curchorem 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	29/08/2016 12.05 pm	19/09/2016 12.35 pm	29/09/2016 12.00 pm
2	Weather	Sunny	Cloudy	Sunny
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.08	6.41	6.33
7	Temperature °C	27.7	27	28.3
8	Cond µs/cm	90.66	65.93	67.03
9	Turb NTU	5	4.75	6.25
10	DO mg/l	5.9	7.5	4.3
11	BOD mg/l	0.9	1.2	0.8
12	COD mg/l	2	9	13
13	Total Dissolved Solids mg/l	57	44	47
14	Total Solids mg/l	119	87	94
15	Chromium mg/l	0.351	ND	ND
16	Lead mg/l	ND	ND	ND
17	Zinc mg/l	0.131	0.07	0.101
18	Copper mg/l	0.012	0.031	0.054

Paraste, Harmalkar wada, Pernem 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 11.45 am	16/09/2016 11.45 am	23/09/2016 11.00am
2	Weather	Cloudy	Raining	Raining
3	Colour	Slightly Turbid	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.6	8.15	6.9
7	Temperature °C	29	29	28
8	Cond µs/cm	272.72	24790	172.94
9	Turb NTU	16.46	16.48	5.35
10	DO mg/l	7.4	9.32	7.4
11	BOD mg/l	1.2	1.9	0.6
12	COD mg/l	2	23	26
13	Total Dissolved Solids mg/l	163	14874	121
14	Total Solids mg/l	198	10001	234
15	Chromium mg/l	0.301	0.454	ND
16	Lead mg/l	ND	0.062	ND
17	Zinc mg/l	0.09	0.137	0.317
18	Copper mg/l	0.008	0.033	0.042

Daudkiwada River, Daudkiwada-velus, ward no. 1, Valpoi 2016

Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	26/08/2016 12.00 pm	16/09/2016 1.10 pm	23/09/2016 12.00 pm
2	Weather	Cloudy	Cloudy	Raining
3	Colour	Colourless	Colourless	Slightly Turbid
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.28	6.55	6.34
7	Temperature °C	28	27.1	25
8	Cond µs/cm	77.04	74.1	59.81
9	Turb NTU	2.59	1.92	65.3
10	DO mg/l	7.7	7.7	7.2
11	BOD mg/l	0.6	0.9	1.3
12	COD mg/l	1	16	12
13	Total Dissolved Solids mg/l	16	22	40
14	Total Solids mg/l	27	41	93
15	Chromium mg/l	0.366	ND	ND
16	Lead mg/l	ND	ND	ND
17	Zinc mg/l	0.151	0.153	0.11
18	Copper mg/l	0.015	0.024	0.051

Near bridge, Orcotto, ward no. 4, Sanguem 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	29/08/2016 12.55 pm	19/09/2016 11.30 am	26/09/2016 1.30 pm
2	Weather	Sunny	Sunny	Sunny
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.15	6.28	6.49
7	Temperature °C	28.6	28	27.5
8	Cond µs/cm	62.87	55.96	62.98
9	Turb NTU	5.21	9.02	4.9
10	DO mg/l	6.4	6	7.1
11	BOD mg/l	0.7	0.6	1.6
12	COD mg/l	7	9	8
13	Total Dissolved Solids mg/l	40	40	40
14	Total Solids mg/l	68	75	90
15	Chromium mg/l	0.409	ND	ND
16	Lead mg/l	ND	ND	ND
17	Zinc mg/l	0.082	0.203	0.105
18	Copper mg/l	0.018	0.032	0.053

Pimpolcotto, ward no. 2, Sanguem 2016				
Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	29/08/2016 11.40 am	19/09/2016 12.05 pm	26/09/2016 11.00 pm
2	Weather	Sunny	Sunny	Sunny
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.21	6.46	6.5
7	Temperature °C	29	28	28
8	Cond µs/cm	95.21	62.9	84.33
9	Turb NTU	2.17	2.56	15.76
10	DO mg/l	7.2	6.5	6.2
11	BOD mg/l	0.9	0.8	0.2
12	COD mg/l	2	6	4
13	Total Dissolved Solids mg/l	65	46	53
14	Total Solids mg/l	130	72	101
15	Chromium mg/l	0.348	ND	0.306
16	Lead mg/l	ND	ND	ND
17	Zinc mg/l	0.197	0.336	0.112
18	Copper mg/l	0.017	0.034	0.059

Panefond River, Kindlebag, ward no. 5, Canacona 2016				
Sr.No	Parameters	Before Ganesh Visarjan	After Ganesh Visarjan	After 15 day of Ganesh visarjan
1	Date & Time	29/08/2016 1.45 pm	19/09/2016 1.15 pm	26/09/2016 1.00 pm
2	Weather	Cloudy	Sunny	Sunny
3	Colour	Colourless	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	6.9	7.03	7.62
7	Temperature °C	27	29	29
8	Cond µs/cm	90.02	9.62	375.38
9	Turb NTU	4.86	5.86	14.7
10	DO mg/l	7.7	6.5	7.2
11	BOD mg/l	1.4	1	0.7
12	COD mg/l	23	19	10
13	Total Dissolved Solids mg/l	59	5291	206
14	Total Solids mg/l	80	5772	225
15	Chromium mg/l	0.53	0.408	0.364
16	Lead mg/l	0.091	0.612	ND
17	Zinc mg/l	0.629	0.171	0.122
18	Copper mg/l	0.026	0.059	0.057

Baina Beach, Vasco 2016

Sr.No	**Parameters**	**Before Ganesh Visarjan**	**After Ganesh Visarjan**	**After 15 day of Ganesh visarjan**
1	Date & Time	29/08/2016 11.30 am	19/09/2016 11.30 am	26/09/2016 11.00 pm
2	Weather	Sunny	Sunny	Sunny
3	Colour	Slightly Turbid	Colourless	Colourless
4	Odour	Odourless	Odourless	Odourless
5	Human Activity	None	None	None
6	pH	7.15	6.46	7.79
7	Temperature °C	26	29	28.9
8	Cond ms/cm	53.44	54.54	53.32
9	Turb NTU	19.36	7.53	3.75
10	DO mg/l	6.7	6.7	5.3
11	BOD mg/l	3.5	1.9	0.5
12	COD mg/l	-	-	-
13	Total Dissolved Solids mg/l	31000	29997	29326
14	Total Solids mg/l	40771	32724	31992
15	Chromium mg/l	2.521	1.551	1.573
16	Lead mg/l	0.042	0.241	1.03
17	Zinc mg/l	0.218	0.167	0.173
18	Copper mg/l	0.193	0.14	0.1743

ANNEXURE V

Ambient Air Quality Monitoring Data (AAQM)

Station : Panaji

PANAJI (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.04.2016	3.0	10.0	39.0	66.0
06.04.2016	2.0	13.0	103.0	47.0
13.04.2016	6.0	7.0	77.0	39.0
15.04.2016	2.0	9.0	62.0	65.0
20.04.2016	2.0	3.0	63.0	55.0
22.04.2016	2.0	11.0	33.0	37.0
27.04.2016	2.0	2.0	40.0	80.0
29.04.2016	2.0	5.0	44.0	44.0
Limits^:-	80	80	100	60

PANAJI (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
04.05.2016	3.0	6.0	54.0	37.0
06.05.2016	2.0	6.0	36.0	30.0
11.05.2016	2.0	6.0	39.0	33.0
13.05.2016	5.0	7.0	73.0	26.0
18.05.2016	1.0	5.0	45.0	30.0
20.05.2016	4.0	6.0	48.0	23.0
25.05.2016	13.0	3.0	131.0	18.0
27.05.2016	8.0	3.0	73.0	21.0
Limits^:-	80	80	100	60

PANAJI (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.06.2016	6.0	6.0	114.0	60.0
03.06.2016	2.0	5.0	74.0	17.0
08.06.2016	1.0	5.0	21.0	-
10.06.2016	1.0	7.0	22.0	-
15.06.2016	3.0	4.0	39.0	-
17.06.2016	3.0	5.0	62.0	20.0
22.06.2016	3.0	8.0	39.0	-
24.06.2016	4.0	10.0	21.0	-
29.06.2016	-	-	-	-
Limits^:-	80	80	100	60

PANAJI (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.07.2016	2.0	18.0	43.0	-
06.07.2016	4.0	5.0	34.0	-
08.07.2016	2.0	7.0	53.0	-
13.07.2016	2.0	7.0	34.0	-
15.07.2016	2.0	7.0	40.0	-
20.07.2016	-	-	-	-
22.07.2016	-	-	-	-
27.07.2016	4.0	11.0	14.0	-
29.07.2017	2.0	4.0	18.0	-
Limits^:-	80	80	100	60

PANAJI (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
03.08.2016	3.0	2.0	23.0	-
05.08.2016	4.0	4.0	23.0	-
10.08.2016	4.0	5.0	47.0	-
12.08.2016	1.0	4.0	48.0	-
17.08.2016	1.0	2.0	68.0	-
19.08.2016	3.0	4.0	100.0	-
24.08.2016	2.0	12.0	29.0	-
26.08.2016	2.0	6.0	38.0	-
31.08.2016	1.0	3.0	41.0	-
Limits^:-	80	80	100	60

PANAJI (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02.09.2016	5.0	10.0	34.0	-
07.09.2016	3.0	8.0	39.0	-
09.09.2016	3.0	13.0	42.0	-
14.09.2016	3.0	8.0	61.0	-
16.09.2016	2.0	5.0	23.0	-
21.09.2016	2.0	7.0	33.0	-
23.09.2016	2.0	4.0	47.0	-
28.09.2016	2.0	11.0	67.0	-
30.09.2017	3.0	10.0	34.0	-
Limits^:-	80	80	100	60

PANAJI (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
05.10.2016	2.0	5.0	25.0	-
07.10.2016	4.0	7.0	34.0	-
10.10.2016	1.0	8.0	25.0	-
13.10.2016	2.0	6.0	96.0	-
19.10.2016	2.0	10.0	50.0	-
21.10.2016	3.0	10.0	70.0	-
24.10.2016	3.0	14.0	69.0	55.0
30.10.2016	1.0	11.0	98.0	123.0
Limits^:-	80	80	100	60

PANAJI (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02.11.2016	1.0	7.0	56.0	42.0
04.11.2016	1.0	6.0	34.0	-
09.11.2016	6.0	8.0	76.0	-
11.11.2016	7.0	10.0	125.0	-
16.11.2016	1.0	13.0	54.0	-
18.11.2016	1.0	19.0	113.0	-
23.11.2016	2.0	11.0	125.0	67.0
25.11.2016	2.0	11.0	267.0	90.0
30.11.2016	5.0	10.0	98.0	45.0
Limits^:-	80	80	100	60

PANAJI (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02.12.2016	5.0	12.0	49.0	35.0
07.12.2016	1.0	16.0	30.0	-
09.12.2016	1.0	11.0	56.0	58.0
14.12.2017	9.0	7.0	96.0	102.0
16.12.2017	12.0	21.0	49.0	75.0
21.12.2016	4.0	21.0	81.0	75.0
23.12.2016	4.0	27.0	88.0	-
28.12.2016	4.0	9.0	37.0	-
30.12.2016	13.0	14.0	49.0	-
Limits^:-	80	80	100	60

PANAJI (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
04.01.2017	2.4	5.5	70.2	-
06.01.2017	6.5	7.1	116.8	-
11.01.2017	3.4	1.6	231.0	-
13.01.2017	2.4	13.3	117.1	-
18.01.2017	2.8	11.6	196.1	-
20.01.2017	2.7	7.3	208.8	-
23.01.2017	2.3	13.1	129.5	-
25.01.2017	3.6	17.1	104.2	-
Limits^:-	80	80	100	60

PANAJI (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.02.2017	5.5	16.6	109.0	99.5
08.02.2017	7.6	11.7	80.6	43.8
10.02.2017	2.6	11.4	88.8	38.5
15.02.2017	1.8	13.3	136.7	51.8
17.02.2017	2.8	13.7	239.4	72.8
22.02.2017	2.0	9.0	95.9	62.3
24.02.2017	5.0	18.9	55.3	56.2
Limits^:-	80	80	100	60

PANAJI (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.03.2017	5.2	22.6	157.0	-
03.03.2017	3.8	18.3	76.4	65.7
08.03.017	4.0	18.0	66.0	38.6
10.03.2017	-1.4	5.3	162.9	46.5
15.03.2017	-2.0	6.6	179.7	24.3
17.03.2017	3.0	6.6	258.4	17.0
22.03.2017	0.3	14.6	251.7	70.6
24.03.2017	-2.2	26.2	51.1	84.2
27.03.2017	0.1	11.2	31.2	61.5
30.03.2017	5.1	21.3	31.9	30.4
Limits^:-	80	80	100	60

^ schedule VII EPR,1986 as amended

O_3 & CO: 1 hr average

SO_2, Nox,PM10, PM 2.5 & Pb: 24 hrly average,

BDL- Below Detection Limit

Station : Mapusa

MAPUSA (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
04.04.2016	BDL	BDL	245.6	124.3
06.04.2016	BDL	15.6	211.6	21.7
11.04.2016	19.1	BDL	209.4	70.6
13.04.2016	BDL	BDL	214.2	43.2
19.04.2016	BDL	13.3	188.7	60.9
21.04.2016	BDL	13.4	222.7	17.3
26.04.2016	BDL	BDL	181.2	19.2
28.04.2016	BDL	10.9	268.1	21.6
Limits^:-	80	80	100	60

MAPUSA(MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
03.05.2016	BDL	BDL	170.1	32.2
05.05.2016	BDL	BDL	130.7	14.4
10.05.2016	BDL	BDL	131.5	9.7
12.05.2016	6.5	12.4	47.0	28.4
17.05.2016	BDL	BDL	97.4	26.1
19.05.2016	BDL	13.7	69.7	15.5
24.05.2016	BDL	12.4	111.2	12.8
26.05.2016	BDL	11.0	62.6	15.8
31.05.2016	BDL	15.2	49.2	30.0
Limits^:-	80	80	100	60

MAPUSA (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02.06.2016	BDL	15.9	56.5	*
07.06.2016	BDL	13.1	22.3	*
09.06.2016	BDL	12.2	22.7	*
14.06.2016	BDL	13.9	60.5	*
16.06.2016	BDL	11.3	54.9	*
21.06.2016	*	*	*	*
23.06.2016	*	*	*	*
28.06.2016	*	*	*	*
30.06.2016	*	*	*	*
Limits^:-	80	80	100	60

MAPUSA (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
05.07.2016	*	*	*	*
07.07.2016	*	*	*	*
12.07.2016	*	*	*	*
14.07.2016	*	*	*	*
19.07.2016	*	*	*	*
21.07.2016	*	*	*	*
26.07.2016	9.3	14.1	36.6	*
28.07.2016	9.4	9.0	15.0	*
Limits^:-	80	80	100	60

MAPUSA (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02.08.2016	BDL	9.6	13.5	*
04.08.2016	*	*	*	*
09.08.2016	BDL	BDL	31.3	*
11.08.2016	BDL	BDL	19.5	*
16.08.2016	5.0	BDL	19.7	*
18.08.2016	4.4	BDL	37.1	*
23.08.2016	*	*	*	*
25.08.2016	10.4	BDL	26.9	*
30.08.2016	*	*	*	*
Limits^:-	80	80	100	60

MAPUSA (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
01.09.2016	BDL	BDL	37.7	*
07.09.2016	5.6	BDL	38.8	*
09.09.2016	22.5	BDL	46.0	*
14.09.2016	9.2	BDL	55.6	*
16.09.2016	BDL	BDL	26.2	*
20.09.2016	BDL	BDL	65.3	*
22.09.2016	11.7	10.1	134.3	*
27.09.2016	4.7	11.6	86.4	*
29.09.2016	BDL	BDL	65.1	*
Limits^:-	80	80	100	60

MAPUSA (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/ m3	PM2.5 µg/m3
04.10.2016	BDL	BDL	39.2	*
06.10.2016	BDL	BDL	67.0	*
12.10.2016	BDL	BDL	55.2	*
14.10.2016	BDL	BDL	63.2	*
18.10.2016	BDL	BDL	122.9	*
20.10.2016	BDL	BDL	127.6	*
25.10.2016	BDL	12.2	104.9	*
30.10.2016	BDL	9.1	117.5	*
Limits^:-	80	80	100	60

MAPUSA (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/ m3	PM2.5 µg/m3
01.11.2016	BDL	BDL	101.1	*
03.11.2016	2.0	BDL	111.2	*
08.11.2016	BDL	BDL	130.6	*
10.11.2016	BDL	BDL	155.0	*
15.11.2016	BDL	BDL	121.1	*
17.11.2016	BDL	BDL	197.2	*
22.11.2016	BDL	24.8	218.3	*
24.11.2016	BDL	17.3	122.9	*
29.11.2016	BDL	28.4	137.6	*
Limits^:-	80	80	100	60

MAPUSA (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5 µg/m3
01.12.2016	BDL	24.2	156.9	-
06.12.2016	2.0	25.5	134.7	-
08.12.2016	BDL	17.7	163.9	-
13.12.2016	BDL	24.2	130.9	-
15.12.2016	BDL	13.4	85.9	-
22.12.2016	BDL	20.9	169.2	-
24.12.2016	BDL	25.6	110.0	-
27.12.2016	BDL	13.4	91.0	-
29.12.2016	BDL	19.4	109.8	-
Limits^:-	80	80	100	60

MAPUSA(JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5 µg/m3
03.01.2017	BDL	11.3	110.1	-
05.01.2017	BDL	19.0	116.1	-
10.01.2017	BDL	21.9	108.3	-
12.01.2017	BDL	19.8	126.6	-
17.01.2017	4.4	19.8	90.1	-
19.01.2017	BDL	21.7	83.1	-
23.01.2017	BDL	15.4	66.1	-
25.01.2017	0.7	34.6	75.8	-
31.01.2017	BDL	6.2	138.2	-
Limits^:-	80	80	100	60

MAPUSA(FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/m3
02.02.2017	BDL	11.5	81.3	-
07.02.2017	16.8	13.8	93.8	-
09.02.2017	BDL	18.0	85.7	-
14.02.2017	BDL	BDL	148.7	-
16.02.2017	BDL	16.9	176.8	-
21.02.2017	BDL	13.1	37.8	-
23.02.2017	BDL	18.6	85.4	-
28.02.2017	BDL	22.6	141.4	-
Limits^:-	80	80	100	60

MAPUSA (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5 µg/m3
02.03.2017	BDL	BDL	110.2	-
07.03.2017	BDL	BDL	112.1	-
09.03.2017	BDL	16.6	138.1	-
14.03.2017	BDL	9.1	160.8	-
16.03.2017	BDL	10.6	132.0	-
21.03.2017	4.1	12.4	85.3	-
23.03.2017	BDL	11.3	82.4	-

29.03.2017	BDL	10.2	132.3	-
31.03.2017	BDL	BDL	76.1	-
Limits^:-	80	80	100	60

^ schedule VII EPR,1986 as amended

O_3 & CO: 1 hr average

SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average,

BDL- Below Detection Limit

Station : Fuse Call Office Vasco

FUSE CALL OFFICE VASCO (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5 µg/m3
05/04/2016	3.0	15.0	39.0	44.0
07/04/2016	5.0	24.0	115.0	80.0
12/04/2016	6.0	8.0	77.0	40.0
14/04/2016	4.0	11.0	59.0	23.0
19/04/2016	2.0	6.0	51.0	50.0
21/04/2016	5.0	5.0	35.0	23.0
26/04/2016	6.0	11.0	50.0	33.0
28/04/2016	12.0	3.0	36.0	53.0
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5 µg/m3
03/05/2016	2.0	9.0	29.0	43.0
05/05/2016	10.0	6.0	54.0	39.0
10/05/2016	1.0	5.0	40.0	43.0
12/05/2016	7.0	8.0	34.0	36.0
17/05/2016	6.0	7.0	47.0	37.0
19/05/2016	4.0	4.0	32.0	44.0
24/05/2016	5.0	7.0	26.0	26.0
26/05/2016	24.0	2.0	50.0	24.0
31/05/2016	1.0	9.0	59.0	18.0
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
02/06/2016	3.0	2.0	68.0	59.0
07/06/2016	3.0	1.0	26.0	18.0
09/06/2016	1.0	10.0	308.0	75.0
14/06/2016	6.0	5.0	146.0	-
16/06/2016	2.0	11.0	19.0	-
21/06/2016	-	-	-	-
23/06/2016	-	-	-	-
28/06/2016	-	-	-	-
30/06/2016	-	-	-	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO(JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05/07/2016	-	-	-	-
12/07/2016	-	-	-	-
14/07/2016	2.0	16.0	86.0	-
19/07/2016	-	-	-	-
21/07/2016	-	-	-	-
26/07/2016	-	-	-	-
28/07/2016	-	-	-	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO(AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/08/2016	-	-	-	-
04/08/2016	-	-	-	-
09/08/2016	-	-	-	-
11/08/2016	-	-	-	-
16/08/2016	-	-	-	-
18/08/2016	2.0	3.0	85.0	-
23/08/2016	-	-	-	-
25/08/2016	-	-	-	-
30/08/2016	-	-	-	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/09/2016	-	-	-	-
08/09/2016	-	-	-	-
12/09/2016	-	-	-	-
15/09/2016	4.0	17.0	44.0	-
20/09/2016	2.0	9.0	84.0	-
22/09/2016	4.0	9.0	68.0	-
27/09/2016	3.0	9.0	56.0	-
29/09/2016	3.0	8.0	76.0	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
04/10/2016	3.0	7.0	40.0	-
06/10/2016	2.0	8.0	54.0	-
12/10/2016	3.0	9.0	26.0	-
14/10/2016	1.0	8.0	114.0	-
18/10/2016	4.0	6.0	130.0	-
20/10/2016	4.0	6.0	58.0	43.0
25/10/2016	4.0	21.0	43.0	30.0
30/10/2016	6.0	34.0	128.0	167.0
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
01/11/2016	7.0	14.0	63.0	72.0
03/11/2016	1.0	19.0	86.0	113.0
08/11/2016	4.0	21.0	100.0	74.0
10/11/2016	6.0	8.0	55.0	102.0
15/11/2016	1.0	11.0	101.0	72.0
17/11/2016	1.0	5.0	104.0	43.0
22/11/2016	1.0	10.0	137.0	96.0
24/11/2016	2.0	9.0	98.0	82.0
29/11/2016	5.0	14.0	76.0	56.0
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
01/12/2016	7.0	9.0	93.0	78.0
06/12/2016	2.0	10.0	124.0	72.0
08/12/2016	2.0	12.0	105.0	86.0
13/12/2016	2.0	5.0	70.0	-
15/12/2016	6.0	5.0	33.0	-
20/12/2016	3.0	12.0	108.0	-
22/12/2016	7.0	8.0	121.0	-
27/12/2016	2.0	3.0	66.0	-
29/12/2016	4.0	8.0	78.0	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
03/01/2017	3.3	4.5	46.9	-
05/01/2017	-	-	-	-
10/01/2017	-	-	-	-
12/01/2017	-	-	-	-
17/01/2017	-	-	-	-
19/01/2017	-	-	-	-
24/01/2017	-	-	-	-
27/01/2017	4.0	3.4	164.0	-
31/01/2017	2.0	3.4	53.8	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO(FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
02/02/2017	3.0	10.9	120.2	-
07/02/2017	3.7	9.5	59.9	-
09/02/2017	3.0	8.8	91.3	-
14/02/2017	1.9	9.8	88.5	-
16/02/2017	4.9	10.7	123.5	-
21/02/2017	2.7	8.5	126.3	-
23/02/2017	4.4	6.0	139.8	-
28/02/2017	4.0	9.4	101.0	-
Limits^:-	80	80	100	60

FUSE CALL OFFICE VASCO (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02/03/2017	8.6	9.0	176.0	-
07/03/2017	0.6	13.1	122.0	-
09/03/2017	-1.8	20.0	79.9	-
14/03/2017	-1.1	7.8	60.4	-
16/03/2017	1.0	15.5	58.8	-
21/03/2017	2.7	11.0	138.6	-
23/03/2017	-1.2	8.2	99.8	-
29/03/2017	0.4	7.9	55.0	-
31/03/2017	1.0	6.7	75.5	-
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Fire Station MPT

FIRE STATION MPT (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
01/04/2016	3.0	5.0	99.0	29.0
05/04/2016	6.0	11.0	90.0	40.0
07/04/2016	2.0	11.0	87.0	52.0
12/04/2016	3.0	4.0	94.0	33.0
14/04/2016	3.0	4.0	77.0	58.0
19/04/2016	2.0	6.0	53.0	33.0
21/04/2016	5.0	4.0	69.0	48.0
26/04/2016	-1.0	5.0	93.0	15.0
28/04/2016	3.0	3.0	44.0	123.0
Limits^:-	80	80	100	60

FIRE STATION MPT (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.05.2016	4.0	7.0	15.0	22.0
05.05.2016	20.0	10.0	71.0	22.0
10.05.2016	0.0	5.0	76.0	50.0
12.05.2016	4.0	4.0	65.0	52.0
17.05.2016	10.0	12.0	99.0	84.0
19.05.2016	3.0	7.0	103.0	37.0
24.05.2016	8.0	6.0	76.0	19.0
26.05.2016	16.0	5.0	49.0	27.0
31/05/2016	1.0	13.0	100.0	54.0
Limits^:-	80	80	100	60

FIRE STATION MPT (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02.06.2016	14.0	4.0	37.0	2.0
07.06.2016	2.0	3.0	113.0	34.0
09.06.2016	1.0	7.0	67.0	42.0
14.06.2016	3.0	1.0	225.0	-
16.06.2016	3.0	9.0	124.0	-
21.06.2016	-	-	-	-
23.06.2016	-	-	-	-
29.06.2016	-	-	-	-
30.06.2016	-	-	-	-
Limits^:-	80	80	100	60

FIRE STATION MPT (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.07.2016	3.0	10.0	50.0	-
12.07.2016	1.0	7.0	53.0	-
14.07.2016	0.0	7.0	121.0	-
19.07.2016	-	-	-	-
21.07.2016	-	-	-	-
26.07.2016	2.0	9.0	87.0	-
28.07.2016	4.0	5.0	101.0	-
Limits^:-	80	80	100	60

FIRE STATION MPT (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.08.2016	2.0	2.0	37.0	-
04.08.2016	-	-	-	-
09.08.2016	4.0	13.0	68.0	-
11.08.2016	4.0	3.0	52.0	-
16.08.2016	2.0	4.0	28.0	-
18.08.2016	1.0	9.0	85.0	-
23.08.2016	-	-	-	-
25.08.2016	10.0	4.0	56.0	-
30.08.2016	-	-	-	-
Limits^:-	80	80	100	60

FIRE STATION MPT (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.09.2016	1.0	4.0	63.0	-
08.09.2016	8.0	13.0	56.0	-
12.09.2016	33.0	5.0	59.0	-
15.09.2016	2.0	8.0	109.0	-
20.09.2016	3.0	8.0	69.0	-
22.09.2016	5.0	9.0	37.0	-
27.09.2016	5.0	7.0	31.0	-
29.09.2016	2.0	1.0	47.0	-
Limits^:-	80	80	100	60

FIRE STATION MPT (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.10.2016	2.0	4.0	37.0	-
06.10.2016	1.0	6.0	132.0	-
12.10.2016	4.0	4.0	110.0	-
14.10.2016	4.0	5.0	123.0	-
18.10.2016	4.0	9.0	108.0	-
20.10.2016	3.0	18.0	193.0	-
25.10.2016	1.0	14.0	224.0	-
30.10.2016	2.0	8.0	230.0	-
Limits^:-	80	80	100	60

FIRE STATION MPT (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
01.11.2016	2.0	13.0	184.0	17.0
03.11.2016	2.0	13.0	192.0	84.0
08.11.2016	3.0	13.0	178.0	12.0
10.11.2016	2.0	12.0	144.0	58.0
15.11.2016*	5.0	6.0	136.0	92.0
17.11.2016	3.0	5.0	129.0	63.0
22.11.2016	1.0	6.0	118.0	59.0
24.11.2016	2.0	7.0	111.0	40.0
29.11.2016	4.0	7.0	129.0	40.0
Limits^:-	80	80	100	60

FIRE STATION MPT (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.12.2016	7.0	4.0	144.0	49.0
06.12.2016	9.0	7.0	148.0	58.0
08.12.2016	3.0	8.0	132.0	71.0
13.12.2016	21.0	2.0	113.0	56.0
15.12.2016	10.0	6.0	108.0	49.0
20.12.2016	6.0	2.0	103.0	61.0
22.12.2016	5.0	8.0	97.0	84.0
27.12.2016	5.0	4.0	74.0	36.0
29.12.2016	12.0	6.0	156.0	20.0
Limits^:-	80	80	100	60

FIRE STATION MPT (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.01.2017	2.7	4.8	350.2	89.5
05.01.2017	3.6	6.0	128.4	43.1
10.01.2017	6.4	8.1	190.9	56.2
12.01.2017	2.6	3.4	176.8	41.6
17.01.2017	2.4	8.1	179.3	38.0
19.01.2017	3.9	10.2	146.2	61.8
24.01.2017	2.8	5.6	301.6	73.3
27.01.2017	2.3	8.6	325.6	39.7
31.01.2017	2.6	6.8	63.1	96.4
Limits^:-	80	80	100	60

FIRE STATION MPT (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	2.0	11.9	482.2	-
07.02.2017	3.1	19.6	255.9	22.6
09.02.2017	2.0	10.2	188.3	279.2
14.02.2017	2.0	14.1	261.2	55.5
16.02.2017	6.0	8.8	145.9	47.2
21.02.2017	-	-	-	-
23.02.2017	-	-	-	-
Limits^:-	80	80	100	60

FIRE STATION MPT (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.03.2017	2.0	6.2	155.5	42.1
07.03.2017	1.3	8.2	293.0	79.9
09.03.2017	2.0	17.2	206.3	40.4
14.03.2017	2.0	4.2	156.0	42.8
16.03.2017	5.5	12.2	146.0	26.6
21.03.2017	1.2	12.1	90.2	40.9
23.03.2017	-0.5	5.7	101.7	26.7
29.03.2017	0.9	5.3	177.3	30.3
31.03.2017	2.9	4.6	314.7	-
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Table 5-e Station : Amona

AMONA (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
06.04.2016	4.4	9.0	81.1	25.1
09.04.2016	4.5	9.4	82.5	26.9
13.04.2016	4.7	9.5	83.6	31.2
16.04.2016	4.1	8.8	69.6	21.5
20.04.2016	4.3	9.1	77.5	23.8
23.04.2016	4.4	8.8	73.5	22.3
27.04.2016	4.5	9.5	83.2	28.9
30.04.2016	4.4	9.3	79.5	24.0
Limits^:-	80	80	100	60

AMONA (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/ m3	PM2.5 µg/m3
04.05.2016	4.2	8.8	75.4	27.5
07.05.2016	4.5	9.4	77.8	26.2
11.05.2016	4.5	9.5	80.9	31.3
14.05.2016	4.4	9.0	78.0	25.6
18.05.2016	4.2	9.3	77.6	27.6
21.05.2016	4.4	9.5	82.3	32.4
25.05.2016	4.1	9.1	70.3	23.2
28.05.2016	4.1	8.8	64.7	19.8
Limits^:-	80	80	100	60

AMONA (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
01.06.2016	4.5	8.7	61.9	20.7
04.06.2016	4.2	8.5	38.3	12.5
08.06.2016	3.2	7.2	46.9	14.5
11.06.2016	3.5	7.7	41.3	13.7
15.06.2016	3.6	8.6	50.4	15.4
18.06.2016	3.5	8.0	48.1	14.6
22.06.2016	3.3	4.5	56.2	17.0
25.06.2016	3.6	7.2	65.8	19.8
29.06.2016	2.6	5.9	63.0	19.1
Limits^:-	80	80	100	60

AMONA (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	3.0	6.5	23.6	9.3
09.07.2016	2.6	5.6	28.5	10.8
13.07.2016	4.8	10.1	73.9	22.8
16.07.2016	4.0	9.1	55.6	19.0
20.07.2016	3.7	7.9	47.6	16.6
23.07.2016	3.9	9.4	66.7	21.2
27.07.2016	4.1	9.6	59.1	19.6
30.07.2016	3.8	9.5	49.9	17.9
Limits^:-	80	80	100	60

AMONA (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	2.4	6.2	31.3	10.8
06.08.2016	3.8	9.0	47.7	11.5
10.08.2016	4.0	8.4	34.9	11.9
13.08.2016	2.0	6.1	34.0	12.0
17.08.2016	3.7	8.5	40.6	14.5
20.08.2016	3.9	8.7	52.4	16.5
24.08.2016	4.0	8.7	44.7	15.1
27.08.2016	4.1	8.7	53.0	18.1
31.08.2016	4.2	9.1	46.5	15.1
Limits^:-	80	80	100	60

AMONA (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	3.4	9.3	62.6	20.0
07.09.2016	3.9	9.5	66.6	22.7
10.09.2016	5.0	10.6	86.3	27.7
14.09.2016	3.9	9.8	62.8	20.4
17.09.2016	3.8	8.8	51.7	18.4
21.09.2016	3.6	8.5	32.7	12.4
24.09.2016	3.1	7.3	29.1	10.4
28.09.2016	3.9	9.6	45.0	15.1
Limits^:-	80	80	100	60

AMONA (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.10.2016	4.1	9.6	20.9	8.3
07.10.2016	5.2	11.5	34.1	11.0
12.10.2016	6.3	14.3	55.1	18.0
14.10.2016	7.5	16.0	70.8	22.3
18.10.2016	7.0	14.8	79.8	25.6
21.10.2016	6.7	14.7	63.7	19.5
25.10.2016	8.5	19.3	101.9	31.9
28.10.2016	9.0	18.7	122.8	40.6
Limits^:-	80	80	100	60

AMONA (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	5.6	11.7	88.7	36.1
05.11.2016	6.7	14.5	84.8	30.4
09.11.2016	7.7	15.9	115.4	42.6
12.11.2016	8.3	18.7	121.5	43.1
16.11.2016	5.3	12.0	58.4	20.9
19.11.2016	7.9	18.2	121.2	39.3
23.11.2016	7.8	15.3	100.2	37.2
26.11.2016	8.2	16.9	116.9	39.8
30.11.2016	7.4	15.6	106.9	36.3
Limits^:-	80	80	100	60

AMONA (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	8.1	16.8	71.7	23.1
07.12.2016	9.4	18.2	108.8	37.4
10.12.2016	8.6	17.0	125.2	39.6
14.12.2016	8.3	15.4	93.1	29.2
17.12.2016	8.9	19.1	90.4	28.7
21.12.2016	8.7	17.1	101.5	32.0
24.12.2016	9.0	18.0	99.7	31.0
28.12.2016	9.6	16.8	110.5	35.4
31.12.2016	9.9	17.3	112.9	34.3
Limits^:-	80	80	100	60

AMONA (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
04.01.2017	13.1	19.0	107.8	34.2
06.01.2017	10.7	18.4	99.1	32.5
11.01.2017	10.3	17.5	89.1	28.8
13.01.2017	10.9	16.5	91.8	28.1
18.01.2017	11.4	18.1	100.2	31.4
20.01.2017	11.8	17.2	112.6	35.5
25.01.2017	11.2	18.8	120.7	37.4
27.01.2017	11.7	16.9	107.0	33.9
31.01.2017	10.5	17.7	123.6	38.7
Limits^:-	80	80	100	60

AMONA (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	6.9	17.2	95.1	30.1
05.02.2017	6.5	15.1	94.8	27.3
08.02.2017	7.3	14.4	70.8	23.3
10.02.2017	11.5	18.2	96.8	31.5
16.02.2017	6.2	13.4	113.2	35.9
18.02.2017	7.3	15.1	112.9	35.9
21.02.2017	6.3	14.6	75.2	23.4
23.02.2017	7.9	16.9	87.8	28.6
Limits^:-	80	80	100	60

AMONA (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	9.3	18.4	117.9	37.0
03.03.2017	9.6	17.5	101.0	33.3
06.03.2017	8.9	17.0	71.3	22.6
09.03.2017	7.5	17.1	117.4	36.9
15.03.2017	9.5	17.7	63.2	20.7
18.03.2017	8.8	16.9	73.3	23.5
22.03.2017	8.6	17.5	108.3	33.3
24.03.2017	8.3	17.8	69.1	23.3
29.03.2017	7.9	18.0	70.2	22.3
31.03.2017	9.2	18.2	71.9	23.8
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Assanora

ASSANORA (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
06.04.2016	4.4	9.3	85.2	27.1
09.04.2016	4.5	9.2	88.6	33.5
13.04.2016	4.4	9.2	84.1	25.9
16.04.2016	4.2	8.8	77.2	23.3
20.04.2016	4.2	8.9	71.2	21.9
23.04.2016	3.8	8.8	54.3	18.1
27.04.2016	4.1	8.8	64.2	20.3
30.04.2016	4.2	8.7	68.5	22.9
Limits^:-	80	80	100	60

ASSANORA (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
04.05.2016	4.2	9.3	68.1	20.8
07.05.2016	4.3	9.1	58.1	18.9
11.05.2016	4.4	9.2	72.0	28.6
14.05.2016	4.2	8.8	54.5	17.3
18.05.2016	3.8	8.8	47.3	14.7
21.05.2016	4.0	8.7	51.0	16.4
25.05.2016	4.2	8.8	57.4	17.9
28.05.2016	3.8	8.8	45.1	14.0
Limits^:-	80	80	100	60

ASSANORA (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5 µg/m3
01.06.2016	4.1	8.7	52.9	16.1
04.06.2016	3.0	6.8	45.5	14.3
08.06.2016	4.0	8.9	44.9	13.6
11.06.2016	4.2	8.1	30.0	10.6
15.06.2016	3.8	8.5	53.3	16.9
18.06.2016	3.6	8.7	57.8	17.5
22.06.2016	2.6	4.5	53.5	16.8
25.06.2016	3.7	7.8	52.1	15.7
29.06.2016	2.6	4.5	55.0	17.9
Limits^:-	80	80	100	60

ASSANORA (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	4.2	9.1	41.5	13.9
09.07.2016	4.2	8.7	55.9	16.9
13.07.2016	5.6	12.4	59.5	18.3
16.07.2016	4.2	9.2	34.8	12.2
20.07.2016	4.2	8.6	38.1	12.4
23.07.2016	3.5	7.7	27.2	9.0
27.07.2016	2.4	4.5	21.1	7.6
30.07.2016	2.4	5.3	15.4	6.0
Limits^:-	80	80	100	60

ASSANORA (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	3.2	5.6	34.3	11.8
06.08.2016	3.5	8.0	39.5	12.9
10.08.201	2.0	4.5	29.0	10.5
13.08.2016	4.0	8.8	43.1	14.4
17.08.2016	3.6	8.3	46.4	15.1
20.08.2016	4.0	8.6	43.8	14.8
24.08.2016	4.4	9.0	37.3	13.3
27.08.2016	3.9	8.6	39.6	13.4
31.08.2016	4.2	8.6	47.1	15.4
Limits^:-	80	80	100	60

ASSANORA (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	4.1	9.0	46.8	15.0
07.09.2016	3.9	8.3	43.3	14.1
10.09.2016	3.9	9.1	43.5	15.7
14.09.2016	3.4	8.8	35.6	10.5
17.09.2016	4.3	9.1	54.0	17.0
21.09.2016	2.5	5.6	23.4	7.7
24.09.2016	2.0	4.5	29.5	10.8
28.09.2016	3.9	8.4	44.9	15.9
Limits^:-	80	80	100	60

ASSANORA (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.10.2016	5.4	12.1	46.4	16.7
05.10.2016	5.3	12.4	31.3	11.6
08.10.2016	4.9	11.9	30.6	11.0
13.10.2016	7.3	14.9	77.5	26.2
15.10.2016	7.4	15.4	76.5	24.3
19.10.2016	7.2	14.5	56.5	17.9
22.10.2016	7.5	14.9	70.4	21.5
26.10.2016	7.5	15.5	66.6	22.2
29.10.2016	8.0	16.3	85.6	26.8
Limits^:-	80	80	100	60

ASSANORA (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	5.8	11.1	52.9	19.9
05.11.2016	5.8	11.6	61.5	20.4
09.11.2016	6.0	12.8	74.4	22.5
12.11.2016	6.3	13.3	83.0	26.7
16.11.2016	6.1	12.5	71.2	27.5
19.11.2016	8.9	18.1	97.8	27.6
23.11.2016	5.6	11.2	67.5	22.0
26.11.2016	8.2	16.9	96.9	33.3
30.11.2016	9.1	18.6	90.0	28.9
Limits^:-	80	80	100	60

ASSANORA (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	7.2	15.5	59.0	18.0
07.12.2016	9.3	17.2	108.8	32.8
09.12.2016	8.5	15.3	92.0	29.4
14.12.2017	9.0	20.8	80.8	25.9
16.12.2016	6.9	15.9	55.2	17.2
21.12.2016	8.9	16.7	98.4	33.1
23.12.2016	8.4	16.1	92.6	28.8
28.12.2016	8.9	16.3	68.6	17.2
30.12.2016	8.1	16.6	89.6	30.1
Limits^:-	80	80	100	60

ASSANORA (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/m3
04.01.2017	10.9	17.5	86.9	27.8
06.01.2017	11.1	19.7	70.8	24.7
11.01.2017	11.5	18.5	98.0	30.7
13.01.2017	11.6	17.7	74.8	23.8
18.01.2017	11.0	19.5	70.8	23.0
20.01.2017	10.6	16.3	97.1	31.0
25.01.2017	10.3	17.4	69.9	151.4
28.01.2017	12.5	19.1	79.2	25.9
31.01.2017	10.7	19.4	84.6	27.0
Limits^:-	80	80	100	60

ASSANORA (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	9.1	17.5	65.4	19.8
05.02.2017	11.3	21.6	66.3	20.8
08.02.2017	10.7	19.4	47.1	14.9
11.02.2017	8.1	15.5	45.4	14.9
15.02.2017	8.1	18.1	46.7	14.0
17.02.2017	9.5	19.3	51.5	15.8
21.02.2017	8.3	16.9	34.6	11.7
23.02.2017	8.6	18.8	45.6	15.0
Limits^:-	80	80	100	60

ASSANORA (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	10.7	19.7	50.7	17.1
03.03.2017	9.8	17.8	66.9	21.5
08.03.017	9.6	17.7	51.2	16.3
10.03.2017	8.2	16.8	52.8	17.8
15.03.2017	8.0	18.0	49.1	15.9
18.03.2017	9.3	18.3	43.0	14.2
22.03.2017	9.2	18.4	56.0	18.2
24.03.2017	8.8	17.4	56.1	18.7
29.03.2017	10.2	19.5	55.0	18.0
31.03.2017	9.5	19.4	60.0	19.2
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Table 5-f Station : Bicholim

BICHOLIM (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.2	9.3	66.6	21.4
09.04.2016	4.4	9.2	69.8	23.7
13.04.2016	4.2	9.0	59.8	17.3
16.04.2016	3.7	8.7	43.2	14.9
20.04.2016	4.2	9.2	55.7	16.9
23.04.2016	4.0	9.1	44.1	13.7
27.04.2016	3.9	8.7	50.8	15.7
30.04.2016	4.6	9.5	70.6	25.8
Limits^:-	80	80	100	60

BICHOLIM (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.05.2016	3.7	8.7	36.1	10.9
07.05.2016	4.2	9.2	59.4	22.5
11.05.2016	4.1	9.3	54.5	19.7
14.05.2016	4.5	9.5	71.0	27.1
18.05.2016	4.2	9.2	42.5	12.9
21.05.2016	4.2	9.0	52.1	16.5
25.05.2016	3.9	8.8	36.5	11.4
28.05.2016	4.0	9.1	41.5	12.5
Limits^:-	80	80	100	60

BICHOLIM (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.06.2016	4.1	9.0	61.9	21.0
04.06.2016	3.5	7.8	46.2	14.9
08.06.2016	3.7	8.1	31.4	10.1
11.06.2016	3.6	7.6	32.0	11.5
15.06.2016	3.8	7.7	54.3	18.1
18.06.2016	4.0	9.0	55.6	16.9
22.06.2016	2.0	4.5	52.8	15.9
25.06.2016	3.5	7.6	59.7	18.1
29.06.2016	2.0	4.5	67.7	22.1
Limits^:-	80	80	100	60

BICHOLIM (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	3.6	7.2	35.8	13.1
09.07.2016	3.9	8.5	34.4	10.8
13.07.2016	4.4	9.0	79.8	24.3
16.07.2016	4.3	9.2	65.1	23.1
20.07.2016	3.2	6.9	24.0	9.0
23.07.2016	4.0	9.2	22.3	7.8
27.07.2016	3.3	7.2	25.7	9.6
30.07.2016	2.0	4.5	21.9	7.2
Limits^:-	80	80	100	60

BICHOLIM (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	3.8	6.9	32.2	12.3
06.08.2016	3.8	8.4	36.9	12.6
10.08.2016	4.1	8.7	44.7	16.1
13.08.2016	3.7	7.8	42.9	14.5
17.08.2016	4.3	9.1	47.8	15.0
20.08.2016	3.6	9.1	34.8	12.3
24.08.2016	3.7	7.7	38.4	15.0
27.08.2016	3.5	7.8	33.0	12.9
31.08.2016	3.3	6.5	24.8	8.7
Limits^:-	80	80	100	60

BICHOLIM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	4.3	9.4	58.0	22.9
07.09.2016	3.5	8.9	49.5	19.2
10.09.2016	3.5	8.4	41.2	15.6
14.09.2016	2.7	6.4	36.1	12.1
17.09.2016	2.9	8.0	37.8	15.5
21.09.2016	4.9	10.2	79.6	26.6
24.09.2016	3.8	9.6	52.8	17.8
28.09.2016	3.7	9.7	52.6	18.7
30.09.2016	3.5	8.8	43.5	14.4
Limits^:-	80	80	100	60

BICHOLIM (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.10.2016	4.7	12.5	46.6	17.3
08.10.2016	4.1	10.4	24.8	9.3
13.10.2016	6.4	13.8	80.6	25.9
15.10.2016	8.9	17.8	85.2	27.3
19.10.2016	9.0	18.8	89.2	29.4
22.10.2016	8.1	14.6	84.2	28.2
26.10.2016	9.4	20.6	154.5	49.6
29.10.2016	9.5	18.7	149.2	50.1
Limits^:-	80	80	100	60

BICHOLIM (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	9.6	20.7	159.8	50.0
05.11.2016	9.6	21.3	151.4	49.0
09.11.2016	11.3	25.3	158.3	49.5
12.11.2016	14.2	30.7	161.7	52.7
16.11.2016	7.1	16.3	77.8	23.2
19.11.2016	11.2	25.2	155.2	45.7
23.11.2016	9.9	21.5	150.9	48.1
26.11.2016	12.3	27.1	159.6	51.8
30.11.2016	12.1	26.7	157.7	47.4
Limits^:-	80	80	100	60

BICHOLIM (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	7.5	17.8	104.7	33.2
07.12.2016	9.0	18.1	125.6	38.9
09.12.2016	9.6	17.1	127.7	40.0
14.12.2016	8.0	15.5	105.8	33.0
16.12.2016	7.1	15.9	81.9	23.8
21.12.2016	8.8	16.3	108.6	33.8
23.12.2016	8.1	16.8	85.7	27.3
28.12.2016	6.4	15.5	99.7	30.5
30.12.2016	8.2	16.3	109.5	34.5
Limits^:-	80	80	100	60

BICHOLIM (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
04.01.2017	12.6	19.2	91.4	28.3
06.01.2017	12.4	19.0	103.4	31.9
11.01.2017	11.0	17.8	77.7	24.9
13.01.2017	11.1	17.3	96.8	29.5
18.01.2017	10.9	16.4	112.4	35.1
20.01.2017	10.7	16.8	109.3	34.3
25.01.2017	10.5	16.3	113.0	35.5
28.01.2017	9.4	16.9	105.8	33.1
31.01.2017	11.8	16.8	98.1	31.2
Limits^:-	80	80	100	60

BICHOLIM (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	8.5	16.7	95.0	30.6
05.02.2017	12.2	20.5	74.1	24.1
08.02.2017	7.7	14.2	87.2	27.8
10.02.2017	7.6	14.9	87.5	28.4
15.02.2017	6.0	13.4	105.9	34.9
17.02.2017	7.4	14.4	113.1	35.6
21.02.2017	7.6	14.9	73.8	24.4
23.02.2017	7.5	16.3	103.8	33.4
Limits^:-	80	80	100	60

BICHOLIM (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	8.6	17.4	131.5	43.7
03.03.2017	9.0	17.1	109.3	36.9
08.03.2017	9.2	16.1	89.8	29.7
10.03.2017	7.4	15.7	103.0	34.1
15.03.2017	6.8	16.0	65.5	22.0
18.03.2017	8.8	19.0	68.5	23.1
22.03.2017	8.2	19.1	81.8	27.2
24.03.2017	7.3	19.0	63.5	21.7
29.03.2017	8.2	19.5	71.8	24.0
31.03.2017	10.1	17.1	74.0	24.3
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Codli

CODLI (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.1	9.0	67.0	23.2
09.04.2016	3.6	8.6	52.4	15.9
13.04.2016	3.8	8.7	67.2	24.2
16.04.2016	4.2	8.9	69.7	23.2
20.04.2016	4.0	8.6	60.8	18.6
23.04.2016	4.2	9.1	71.7	27.5
27.04.2016	4.0	8.7	59.0	18.8
30.04.2016	4.3	9.0	72.0	25.2
Limits^:-	80	80	100	60

CODLI (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.05.2016	4.0	8.7	53.8	19.0
06.05.2016	4.3	9.0	70.0	27.7
10.05.2016	4.2	9.1	64.7	21.5
13.05.2016	4.2	9.4	64.3	23.1
17.05.2016	4.0	8.6	51.0	16.6
20.05.2016	3.8	8.7	41.7	12.7
24.05.2016	4.1	9.4	55.1	22.9
27.05.2016	3.6	8.6	30.1	11.7
Limits^:-	80	80	100	60

CODLI (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.06.2016	4.0	9.5	49.5	15.0
04.06.2016	3.8	8.8	47.6	14.6
07.06.2016	3.6	8.1	30.8	10.2
10.06.2016	2.9	6.4	49.7	15.0
14.06.2016	4.1	8.7	57.5	17.8
17.06.2016	3.7	8.6	66.3	19.9
21.06.2016	2.9	6.4	43.0	13.1
24.06.2016	3.4	8.1	59.8	18.5
28.06.2016	2.7	6.3	58.2	22.7
Limits^:-	80	80	100	60

CODLI (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.07.2016	4.4	11.1	34.8	12.9
08.07.2016	3.3	8.0	19.0	7.6
12.07.2016	4.2	10.5	66.8	21.7
15.07.2016	4.2	9.0	32.7	11.4
19.07.2016	2.9	5.4	14.2	6.8
22.07.2016	3.5	6.6	16.1	5.7
26.07.2016	4.3	8.7	34.7	11.4
29.07.2016	4.0	9.0	42.0	12.8
Limits^:-	80	80	100	60

CODLI(AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.08.2016	4.1	9.1	30.2	10.8
05.08.2016	3.4	8.0	28.9	9.3
09.08.2016	3.6	8.1	29.1	9.1
13.08.2016	3.6	8.1	47.6	16.0
16.08.2016	3.1	7.6	27.8	10.5
19.08.2016	3.9	9.2	50.4	16.7
23.08.2016	2.5	6.3	22.9	8.2
26.08.2016	3.0	8.7	27.1	9.3
30.08.2016	3.0	7.7	26.0	8.6
Limits^:-	80	80	100	60

CODLI (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.09.2016	2.0	4.5	21.9	8.5
08.09.2016	3.6	8.1	37.0	13.0
11.09.2016	3.5	7.9	28.6	8.7
13.09.2016	3.6	7.8	28.1	10.0
16.09.2016	2.0	4.5	25.0	9.2
20.09.2016	2.0	4.5	15.5	5.8
23.09.2016	2.0	4.5	15.0	5.2
27.09.2016	3.3	8.2	29.7	11.4
30.09.2016	3.4	7.6	34.9	12.6
Limits^:-	80	80	100	60

CODLI (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.10.2016	4.1	9.6	20.9	8.3
07.10.2016	5.2	11.5	34.1	11.0
12.10.2016	6.3	14.3	55.1	18.0
14.10.2016	7.5	16.0	70.8	22.3
18.10.2016	7.0	14.8	79.8	25.6
21.10.2016	6.7	14.7	63.7	19.5
25.10.2016	8.5	19.3	101.9	31.9
28.10.2016	9.0	18.7	122.8	40.6
Limits^:-	80	80	100	60

CODLI (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	9.1	18.5	127.0	42.6
05.11.2016	10.2	17.9	117.5	41.5
08.11.2016	9.2	18.2	126.8	44.4
11.11.2016	9.8	18.8	138.8	45.8
15.11.2016*	9.0	12.3	71.4	29.0
18.11.2016	9.4	19.8	139.9	46.5
22.11.2016	9.6	18.8	102.4	32.8
25.11.2016	9.7	19.7	109.1	36.9
29.11.2016	10.4	19.6	111.8	38.1
Limits^:-	80	80	100	60

CODLI (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02.12.2016	6.9	18.3	92.4	29.6
06.12.2016	7.7	16.5	109.9	34.2
08.12.2016	9.1	19.3	134.1	42.6
13.12.2016	8.9	18.2	119.0	36.1
15.12.2016	8.4	19.1	103.0	31.7
20.12.2016	8.6	17.4	114.6	35.0
22.12.2016	6.7	15.5	95.0	29.4
27.12.2016	8.6	18.4	114.9	35.2
29.12.2016	8.5	19.7	120.5	40.9
Limits^:-	80	80	100	60

CODLI (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.01.2017	12.7	19.7	115.0	38.1
06.01.2017	11.8	18.4	130.2	39.6
10.01.2017	12.0	18.9	106.8	33.7
12.01.2017	10.4	17.8	106.4	33.7
17.01.2017	11.6	18.0	111.9	35.3
19.01.2017	11.0	19.5	106.1	32.9
24.01.2017	11.5	17.8	131.5	41.4
27.01.2017	10.2	18.6	96.5	30.5
31.01.2017	11.4	20.1	103.5	33.3
Limits^:-	80	80	100	60

CODLI (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	13.8	20.8	113.2	37.0
04.02.2017	9.4	21.3	107.2	35.8
07.02.2017	13.0	20.1	97.8	31.6
09.02.2017	11.6	17.9	99.3	32.0
14.02.2017	11.3	17.9	98.0	31.9
16.02.2017	10.0	16.6	112.8	37.2
21.02.2017	11.8	17.7	84.4	27.9
23.02.2017	10.1	18.5	92.0	30.9
Limits^:-	80	80	100	60

CODLI (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
02.03.2017	7.6	15.1	127.3	39.8
04.03.2017	10.0	17.1	168.2	53.3
07.03.2017	7.7	15.3	93.1	30.8
09.03.2017	8.1	15.9	62.6	20.2
15.03.2017	9.2	16.2	83.5	28.0
18.03.2017	10.4	16.5	121.6	39.7
21.03.2017	6.7	18.1	72.5	23.1
23.03.2017	7.6	20.1	130.1	41.7
29.03.2017	6.7	16.2	134.0	43.0
31.03.2017	6.9	21.1	66.0	21.0
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Table 5-h Station : Curchorem

CURCHOREM (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.6	9.3	78.7	29.3
07.04.2016	4.2	9.4	63.0	18.9
12.04.2016	4.7	9.6	83.1	33.2
15.04.2016	4.7	9.5	75.0	22.8
19.04.2016	4.2	9.1	70.7	21.6
22.04.2016	4.4	9.2	73.9	23.0
26.04.2016	4.0	8.7	65.1	20.1
29.04.2016	4.0	9.1	60.1	22.3
Limits^:-	80	80	100	60

CURCHOREM (MAY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
13/05/2016	9.9	10.1	56.7	22.7
16/05/2016	10.3	11.9	44.5	22.9
20/05/2016	7.7	11.1	43.2	20
23/05/2016	8.3	10.8	43	20.3
26/05/2016	7.6	11.4	40.4	20.7
30/05/2016	8.9	11.5	47.1	23.1
Limits^:-	80	80	100	60

CURCHOREM (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/06/2016	6.3	8.1	27.1	16.3
07/06/2016	6.5	9.6	25.9	13.6
10/06/2016	6.5	9.2	26.6	15.2
14/06/2016	6.5	8.1	21.5	12.8
17/06/2016	5.7	8.9	22.8	14.2
21/06/2016	6.1	10.1	26.1	15
24/06/2016	6.9	9.5	27.1	15.4
28/06/2016	5.9	9.2	25.3	14.2
Limits^:-	80	80	100	60

CURCHOREM (JULY 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/07/2016	7.4	9.6	27.1	14.6
05/07/2016	6.9	10.3	27.7	13.7
08/07/2016	5.9	10.2	26.6	12.1
12/07/2016	7.1	9.4	23.7	13.3
15/07/2016	6.7	9.3	22.8	13.3
19/07/2016	6.9	9.6	26.1	14.6
22/07/2016	6.4	9.9	27.1	12.5
26/07/2016	6.5	9.9	38.1	21.7
29/07/2016	7.7	11.4	28.2	16.2
Limits^:-	80	80	100	60

CURCHOREM (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/08/2016	8.2	14.3	35.9	17.1
05/08/2016	7.5	12.9	31.7	17.7
09/08/2016	8.3	15.3	34.3	18.3
12/08/2016	7.3	12.5	30.2	17.4
16/08/2016	6.6	12.7	30.5	20.1
19/08/2016	7.4	10.9	37.7	17.5
23/08/2016	7.8	13.8	36.8	19.9
26/08/2016	7	11.6	31.5	16.5
27/08/2016	6.3	13.3	35.8	20.2
Limits^:-	80	80	100	60

CURCHOREM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/09/2016	7.7	14.8	30.1	15.7
06/09/2016	8.7	12.9	31.5	17.1
09/09/2016	7.8	12.7	29.6	17.1
13/09/2016	9.1	12.9	31	14.6
16/09/2016	7.9	12.7	33	15.4
20/09/2016	8.8	15	29.4	13.7
23/09/2016	8.9	13.2	33.6	16.2
27/09/2016	8.6	13.7	34.1	16.8
30/09/2016	9.2	13.7	35.8	24.6
Limits^:-	80	80	100	60

CURCHOREM (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04/10/2016	5.8	10.9	39.4	18.3
07/10/2016	7	11.9	37.5	22.1
11/10/2016	6.5	11.7	36.6	19.8
14/10/2016	7.4	11.1	36.9	22.1
18/10/2016	6.1	12.7	36.6	20.5
21/10/2016	6.5	11.1	37	19.5
25/10/2016	6.8	11.1	36.1	17.5
28/10/2016	7.2	10.3	37.4	18.7
Limits^:-	80	80	100	60

CURCHOREM (NOVEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/11/2016	6.5	10.9	43.5	22.1
04/11/2016	5.7	13.2	54.1	30.4
08/11/2016	5.1	11.3	45.6	22.9
11/11/2016	5.5	11.1	40.0	18.7
15/11/2016	6.3	12.6	43.8	21.2
18/11/2016	5.9	10.4	45.7	22.5
22/11/2016	5.8	10.8	51.1	25.4
25/11/2016	5.9	10.7	39.9	18.7
29/11/2016	6.7	12.7	44.8	19.6
Limits^:-	80	80	100	60

CURCHOREM (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/12/2016	5.6	11.7	54.3	27.2
06/12/2016	5.3	11.6	57.4	26.2
09/12/2016	5.1	12.2	58.9	24.6
13/12/2016	5.3	11.3	56.1	25.8
16/12/2016	5.9	11.7	65.4	28.7
20/12/2016	6.1	9.9	60.0	27.5
23/12/2016	5.3	11.1	54.8	30.4
27/12/2016	5.3	11.6	61.1	27.9
30/12/2016	5.1	11.5	57.1	27.9
Limits^:-	80	80	100	60

CURCHOREM (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/01/2017	6.5	12.1	62.1	26.6
06/01/2017	5.5	12.5	60.2	27.1
10/01/2017	5.7	12.5	55.1	25.4
14/01/2017	5.3	11.9	54.4	29.1
17/01/2017	5.5	13.8	53.7	23.7
20/01/2017	5.5	12.7	56.9	28.3
24/01/2017	6.2	12.4	61.6	26.6
27/01/2017	5.3	11.4	55.5	27.1
31/01/2017	6.2	11.9	62.6	32.5
Limits^:-	80	80	100	60

CURCHOREM (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/02/2017	5.4	11.3	60.5	30.4
07/02/2017	5.3	13.3	69.0	30.4
10/02/2017	6.1	12.6	65.4	31.2
14/02/2017	4.9	12.3	71.6	30.4
17/02/2017	6.8	13.1	66.4	27.9
21/02/2017	6.0	11.8	66.9	29.2
24/02/2017	5.7	11.2	66.7	30.8
28/02/2017	5.6	13.3	62.0	29.6
Limits^:-	80	80	100	60

CURCHOREM (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/ m3	PM10 µg/m3	PM2.5µg/ m3
03/03/2017	7.9	14.0	74.9	32.4
07/03/2017	7.0	13.4	65.4	31.2
10/03/2017	8.9	12.6	68.7	31.7
14/03/2017	7.6	12.5	71.9	31.2
17/03/2017	6.6	12.3	65.1	32.5
21/03/2017	7.5	14.0	68.5	32.9
24/03/2017	8.1	154.0	73.1	29.6
28/03/2017	6.7	14.8	70.8	32.1
31/03/2017	7.7	13.8	68.9	30.8
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Honda

HONDA (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.2	9.2	54.2	21.5
09.04.2016	4.3	9.1	68.1	26.2
13.04.2016	4.5	9.3	79.3	30.1
16.04.2016	4.4	9.2	62.9	19.7
20.04.2016	3.8	8.7	33.6	10.3
23.04.2016	4.0	8.8	35.4	12.6
27.04.2016	4.2	8.5	40.2	15.2
30.04.2016	4.4	9.2	65.7	27.5
Limits^:-	80	80	100	60

HONDA (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.05.2016	4.4	9.3	52.6	17.9
07.05.2016	4.0	8.8	35.8	12.2
11.05.2016	4.2	8.6	42.0	15.0
14.05.2016	4.4	9.3	77.3	27.5
18.05.2016	4.4	9.2	60.9	22.2
21.05.2016	4.2	9.2	50.4	18.0
25.05.2016	4.3	9.1	51.7	17.4
28.05.2016	3.8	8.7	30.7	10.7
Limits^:-	80	80	100	60

HONDA (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.06.2016	4.9	8.9	40.6	14.5
04.06.2016	4.6	8.5	49.4	19.2
08.06.2016	4.8	8.9	60.0	20.5
11.06.2016	3.4	6.4	47.5	17.3
15.06.2016	4.6	8.9	59.1	21.9
18.06.2016	4.6	8.7	61.2	22.7
22.06.2016	2.9	5.7	73.1	27.1
25.06.2016	3.1	5.9	74.0	25.6
29.06.2016	2.9	5.7	65.3	22.1
Limits^:-	80	80	100	60

HONDA (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	2.5	5.8	28.1	10.3
09.07.2016	3.0	7.4	30.7	11.6
13.07.2016	3.5	7.8	66.7	21.3
16.07.2016	4.4	9.9	68.1	24.6
20.07.2016	3.7	8.6	62.0	20.3
23.07.2016	4.3	9.4	67.2	20.7
27.07.2016	3.2	7.0	56.0	19.0
30.07.2016	3.7	7.4	43.0	14.4
Limits^:-	80	80	100	60

HONDA (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	3.4	7.2	55.7	18.5
06.08.2016	2.8	6.9	21.8	7.8
10.08.2016	3.7	7.8	37.8	12.2
13.08.2016	3.5	8.8	28.4	9.3
17.08.2016	3.6	7.1	26.5	9.0
20.08.2016	2.5	6.4	23.9	8.5
24.08.2016	3.5	7.5	26.6	10.8
27.08.2016	3.8	7.6	32.2	10.2
31.08.2016	2.7	6.4	24.8	9.2
Limits^:-	80	80	100	60

HONDA (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	2.9	6.7	40.5	14.6
07.09.2016	3.3	8.8	43.7	16.0
10.09.2016	3.5	9.3	40.8	13.9
14.09.2016	3.5	6.8	30.6	10.6
17.09.2016	2.9	6.7	38.3	12.8
21.09.2016	2.8	5.7	20.4	7.2
24.09.2016	2.0	4.5	17.4	6.9
28.09.2016	2.5	6.5	21.1	7.0
Limits^:-	80	80	100	60

HONDA (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.10.2016	3.7	8.1	21.2	7.1
04.10.2016	3.8	7.9	15.0	6.1
08.10.2016	3.6	8.4	14.0	5.7
13.10.2016	6.1	12.9	50.9	16.5
15.10.2016	6.5	14.3	43.1	13.9
19.10.2016	8.0	17.0	55.0	20.9
22.10.2016	9.0	18.8	81.2	28.2
27.10.2016	9.4	18.6	180.1	58.5
29.10.2016	9.5	19.4	138.3	43.3
Limits^:-	80	80	100	60

HONDA (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	5.6	11.5	118.3	37.9
05.11.2016	6.2	13.2	133.7	40.5
09.11.2016	7.5	15.5	140.8	46.3
12.11.2016	10.0	19.6	161.5	51.7
16.11.2016	5.5	10.7	91.2	33.4
19.11.2016	9.4	18.0	159.7	50.4
23.11.2016	6.9	14.5	137.1	42.6
26.11.2016	7.9	15.2	148.5	46.3
30.11.2016	9.7	17.6	150.3	47.4
Limits^:-	80	80	100	60

HONDA (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	8.8	17.4	101.6	31.4
07.12.2016	9.2	17.1	140.5	42.4
09.12.2016	7.9	16.7	116.4	36.1
14.12.2016	6.7	15.4	106.3	33.6
16.12.2016	6.4	14.6	84.3	24.0
21.12.2016	8.4	15.9	89.6	27.2
23.12.2016	9.7	17.2	116.2	35.8
28.12.2016	9.6	14.5	114.6	34.8
30.12.2016	9.6	17.0	122.8	39.3
Limits^:-	80	80	100	60

HONDA (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.01.2017	11.7	16.2	108.0	34.5
06.01.2017	10.1	19.6	115.5	37.6
10.01.2017	12.0	16.1	103.8	33.2
12.01.2017	10.3	16.4	122.3	39.2
19.01.2017	12.3	19.7	126.4	40.6
21.01.2017	11.8	18.9	117.4	36.4
25.01.2017	11.7	17.1	124.9	37.7
28.01.2017	10.8	16.1	119.4	37.4
31.01.2017	11.2	16.7	115.4	38.5
Limits^:-	80	80	100	60

HONDA (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	8.8	16.4	106.0	32.7
05.02.2017	8.1	17.0	115.7	35.7
07.02.2017	7.7	17.7	106.6	34.1
09.02.2017	8.1	16.2	111.5	34.9
15.02.2017	8.5	19.1	112.0	36.2
17.02.2017	7.0	15.0	119.4	38.1
21.02.2017	10.8	19.0	95.2	29.6
23.02.2017	11.2	17.1	95.0	30.3
Limits^:-	80	80	100	60

HONDA (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	9.3	17.3	160.5	51.5
03.03.2017	8.1	17.0	191.9	60.4
08.03.2017	7.9	17.8	154.2	48.6
10.03.2017	9.4	15.8	149.6	50.9
14.03.2017	8.9	19.9	112.8	36.1
16.03.2017	6.9	14.8	123.0	40.5
22.03.2017	10.8	18.7	186.1	59.4
24.03.2017	13.5	20.8	157.0	50.7
29.03.2017	10.7	17.3	124.0	40.1
31.03.2017	11.7	16.5	193.9	62.1
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Kundaim

KUNDAIM (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.2	9.0	48.5	18.7
09.04.2016	4.3	9.2	52.5	16.0
13.04.2016	4.3	8.9	48.9	15.1
16.04.2016	4.6	9.4	80.3	25.9
20.04.2016	3.9	9.0	41.7	12.6
23.04.2016	4.0	8.7	42.7	13.2
27.04.2016	4.2	9.2	55.6	18.0
30.04.2016	4.2	9.2	65.9	20.1
Limits^:-	80	80	100	60

KUNDAIM (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.05.2016	4.2	8.8	74.9	29.8
07.05.2016	4.2	9.0	69.9	25.6
11.05.2016	4.6	9.4	79.1	31.3
14.05.2016	3.9	8.9	50.7	16.2
18.05.2016	4.3	9.2	73.5	24.5
21.05.2016	4.2	9.2	66.9	23.6
25.05.2016	4.0	8.7	53.8	16.8
28.05.2016	4.2	9.1	60.7	23.9
Limits^:-	80	80	100	60

KUNDAIM (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.06.2016	4.2	8.4	69.2	26.0
04.06.2016	4.2	8.8	57.8	19.9
08.06.2016	3.7	8.4	46.6	14.7
11.06.2016	3.7	8.5	58.1	18.7
15.06.2016	3.9	7.9	44.1	16.8
18.06.2016	4.0	8.3	51.4	15.9
22.06.2016	2.6	6.2	52.4	18.1
25.06.2016	3.0	6.5	66.9	23.5
29.06.2016	2.7	4.5	64.2	24.5
Limits^:-	80	80	100	60

KUNDAIM (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	2.8	5.9	25.5	8.3
09.07.2016	2.6	6.4	23.0	7.6
13.07.2016	4.2	10.2	60.9	20.4
16.07.2016	4.2	8.6	38.9	12.8
20.07.2016	3.8	8.4	34.2	10.9
23.07.2016	4.2	9.7	43.8	14.6
27.07.2016	4.4	9.2	61.5	19.8
30.07.2016	3.7	9.0	37.6	12.5
Limits^:-	80	80	100	60

KUNDAIM (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.08.2016	3.1	6.3	32.3	11.3
05.08.2016	2.0	4.5	29.8	9.8
09.08.2016	3.5	8.4	39.0	13.0
12.08.2016	3.1	7.4	30.5	11.8
16.08.2016	2.5	5.7	27.9	9.8
19.08.2016	3.5	7.5	37.9	12.6
23.08.2016	3.1	7.4	37.6	13.2
26.08.2016	4.2	8.5	60.7	19.7
30.08.2016	4.1	8.4	43.8	15.0
Limits^:-	80	80	100	60

KUNDAIM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.09.2016	4.6	9.1	60.2	21.5
07.09.2016	3.8	8.4	55.9	21.6
10.09.2016	4.7	10.1	66.1	24.2
14.09.2016	4.1	9.2	43.6	14.2
17.09.2016	4.3	9.2	42.8	14.9
21.09.2016	3.3	7.1	33.1	12.3
24.09.2016	2.5	5.3	19.6	7.5
28.09.2016	3.1	7.0	37.5	15.3
30.09.2016	2.7	6.0	29.3	10.5
Limits^:-	80	80	100	60

KUNDAIM (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.10.2016	4.5	10.9	31.9	11.0
05.10.2016	7.6	16.3	65.1	21.5
14.10.2016	9.2	19.5	87.0	27.7
16.10.2016	9.4	19.8	74.9	24.9
20.10.2016	8.1	17.1	57.5	18.4
22.10.2016	8.8	18.5	71.9	23.2
26.10.2016	8.5	17.2	69.0	22.4
29.10.2016	8.2	17.9	65.5	20.1
Limits^:-	80	80	100	60

KUNDAIM (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	5.8	12.1	86.0	25.9
05.11.2016	6.1	13.0	86.8	27.6
09.11.2016	6.9	15.0	107.2	35.7
12.11.2016	7.9	16.4	115.3	36.1
16.11.2016	5.6	11.8	55.7	18.0
19.11.2016	7.5	15.7	118.2	32.8
23.11.2016	5.8	11.9	72.5	23.8
26.11.2016	7.2	15.4	91.1	28.3
30.11.2016	6.0	12.3	89.5	28.0
Limits^:-	80	80	100	60

KUNDAIM (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.12.2016	8.2	16.3	71.8	22.2
06.12.2016	7.8	17.7	92.4	28.2
08.12.2016	9.7	16.7	92.8	29.7
13.12.2016	8.2	17.6	64.2	19.7
15.12.2016	7.9	15.9	54.7	17.9
20.12.2016	9.0	16.9	84.1	26.3
22.12.2016	8.7	15.6	86.4	28.4
27.12.2016	8.5	17.3	80.3	25.2
29.12.2016	9.6	16.4	74.4	22.7
Limits^:-	80	80	100	60

KUNDAIM (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.01.2017	13.1	19.1	58.5	20.0
05.01.2017	10.0	17.5	48.4	15.5
10.01.2017	11.7	18.5	45.4	14.2
12.01.2017	10.8	16.1	50.0	13.6
17.01.2017	10.4	17.6	122.0	36.7
19.01.2017	11.1	17.1	86.7	28.0
24.01.2017	10.9	17.9	94.9	31.4
27.01.2017	11.6	18.7	83.0	24.2
31.01.2017	11.4	18.4	99.3	32.1
Limits^:-	80	80	100	60

KUNDAIM (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	12.0	16.5	75.1	24.3
04.02.2017	10.5	20.2	84.7	27.5
07.02.2017	12.6	16.8	62.9	21.3
09.02.2017	11.4	17.7	64.8	20.5
14.02.2017	10.4	16.8	67.5	22.4
16.02.2017	11.2	16.8	71.7	23.6
21.02.2017	11.9	17.9	57.0	18.4
23.02.2017	11.4	17.0	76.4	25.1
Limits^:-	80	80	100	60

KUNDAIM (MARCH 2017)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.03.2017	10.7	17.0	93.2	31.2
04.03.2017	9.5	20.1	62.5	21.2
07.03.2017	10.6	16.4	103.8	33.6
09.03.2017	10.4	17.2	101.2	32.7
15.03.2017	9.6	16.7	54.1	17.3
18.03.2017	9.2	16.6	66.1	21.2
21.03.2017	10.3	17.7	67.1	21.7
23.03.2017	9.3	16.5	69.4	22.6
29.03.2017	9.0	17.6	72.8	23.8
31.03.2017	8.1	17.8	60.4	19.7
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Margao

MARGAO (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.4	9.1	73.9	26.6
07.04.2016	4.3	8.7	72.3	24.8
12.04.2016	4.9	9.6	76.2	23.1
15.04.2016	4.7	9.3	79.2	24.3
19.04.2016	4.9	9.8	81.1	25.1
22.04.2016	3.8	9.1	69.1	26.3
26.04.2016	4.6	9.5	70.0	27.5
29.04.2016	3.8	8.6	67.1	22.3
Limits^:-	80	80	100	60

MARGAO (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.05.2016	4.8	9.6	81.5	32.1
06.05.2016	4.7	9.5	71.7	22.7
10.05.2016	4.3	8.6	63.4	19.7
13.05.2016	3.8	9.1	55.8	17.8
17.05.2016	4.7	9.3	77.4	27.4
20.05.2016	4.9	9.8	80.9	29.7
24.05.2016	4.4	9.1	63.7	20.8
27.05.2016	3.8	8.7	62.9	19.4
Limits^:-	80	80	100	60

MARGAO (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.06.2016	4.4	8.9	53.7	19.1
04.06.2016	4.0	8.5	51.0	17.9
07.06.2016	4.1	8.9	49.8	18.8
10.06.2016	3.9	7.4	33.1	15.6
14.06.2016	4.2	9.0	55.9	20.8
17.06.2016	3.7	8.9	48.5	15.8
21.06.2016	2.0	4.5	46.4	22.4
24.06.2016	3.5	8.5	52.3	23.0
28.06.2016	2.0	4.5	63.4	34.4
Limits^:-	80	80	100	60

MARGAO (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.07.2016	3.7	8.4	42.5	14.4
08.07.2016	4.3	8.7	44.9	16.8
12.07.2016	4.5	9.3	64.1	20.3
15.07.2016	4.2	10.3	65.6	20.5
19.07.2016	2.7	6.5	34.0	11.6
22.07.2016	2.0	6.4	28.4	9.7
26.07.2016	4.2	8.5	46.4	14.7
29.07.2016	4.0	8.9	44.8	15.8
Limits^:-	80	80	100	60

MARGAO (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.08.2016	3.7	8.6	36.5	11.8
05.08.2016	3.7	8.8	36.1	11.9
09.08.2016	3.5	7.9	45.0	13.8
12.08.2016	4.0	8.9	45.7	13.9
16.08.2016	4.4	9.4	61.0	19.0
19.08.2016	4.0	8.7	56.1	17.9
23.08.2016	2.0	4.5	21.5	8.2
26.08.2016	4.0	9.0	53.1	17.6
30.08.2016	3.1	7.3	28.2	9.0
Limits^:-	80	80	100	60

MARGAO (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.09.2016	3.1	7.5	24.3	9.7
08.09.2016	2.0	4.5	20.4	8.3
11.09.2016	3.1	7.6	22.4	9.2
13.09.2016	3.4	8.5	34.0	11.1
16.09.2016	3.0	8.0	31.1	10.9
20.09.2016	3.5	8.6	38.1	13.7
23.09.2016	2.0	4.5	17.6	6.8
27.09.2016	3.0	7.7	23.9	7.9
30.09.2016	3.1	7.5	27.8	10.5
Limits^:-	80	80	100	60

MARGAO (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.10.2016	4.2	9.7	18.4	7.7
07.10.2016	4.3	9.4	20.8	10.0
12.10.2016	5.3	12.0	41.7	15.3
14.10.2016	6.1	13.3	64.4	19.8
18.10.2016	7.1	16.4	76.9	25.6
21.10.2016	8.7	17.8	86.5	28.9
24.10.2016	13.7	16.6	129.8	43.0
30.10.2016	15.0	19.0	101.9	30.8
Limits^:-	80	80	100	60

MARGAO (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	6.0	12.6	93.7	30.1
05.11.2016	5.4	11.3	72.0	23.9
08.11.2016	8.7	17.6	106.6	34.7
11.11.2016	9.5	19.4	130.7	34.8
15.11.2016	7.1	15.3	102.9	32.6
18.11.2016	8.7	18.1	144.0	39.7
22.11.2016	7.3	14.9	105.7	28.5
25.11.2016	6.1	13.1	104.1	28.2
29.11.2016	5.8	12.8	98.6	33.6
Limits^:-	80	80	100	60

MARGAO (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.12.2016	8.5	17.6	85.2	26.4
06.12.2016	8.6	18.4	105.5	34.2
08.12.2016	8.7	18.3	120.2	37.6
13.12.2016	8.8	17.0	90.9	30.2
15.12.2016	9.8	16.3	61.4	22.3
20.12.2016	9.6	17.3	86.2	32.4
22.12.2016	9.4	17.9	91.9	31.8
27.12.2016	8.9	17.4	90.9	28.3
29.12.2016	9.2	18.4	87.1	32.2
Limits^:-	80	80	100	60

MARGAO (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.01.2017	12.8	18.0	115.4	43.4
05.01.2017	10.4	18.4	95.5	46.2
10.01.2016	13.3	20.4	70.4	23.6
12.01.2016	12.2	17.0	89.1	29.0
17.01.2016	10.9	17.4	107.5	34.4
19.01.2016	11.0	18.2	96.5	31.2
24.01.2017	11.3	17.8	114.3	37.4
27.01.2017	11.8	19.1	112.1	35.6
31.01.2017	11.1	16.8	108.0	34.8
Limits^:-	80	80	100	60

MARGAO (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.02.2017	7.8	16.1	85.9	27.5
05.02.2017	8.6	18.3	83.4	28.9
07.02.2017	10.0	20.5	56.5	18.6
09.02.2017	8.0	14.7	68.4	23.3
14.02.2017	9.9	15.0	66.8	23.2
16.02.2017	12.4	20.6	87.5	29.1
21.02.2017	9.0	16.2	49.3	15.9
23.02.2017	9.7	18.6	74.8	23.9
Limits^:-	80	80	100	60

MARGAO (MARCH 2017)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.03.2017	7.1	17.3	75.6	23.7
04.03.2017	8.5	17.9	49.0	16.1
07.03.2017	11.1	20.5	108.7	33.7
09.03.2017	7.7	17.5	87.6	27.5
15.03.2017	9.7	18.3	59.4	18.7
18.03.2017	9.4	17.4	57.9	18.4
21.03.2017	10.7	18.6	85.4	27.5
23.03.2017	9.1	17.7	83.1	26.5
29.03.2017	10.0	19.8	105.8	33.6
31.03.2017	8.0	17.2	64.1	21.0
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Ponda

PONDA (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.3	8.8	62.6	22.8
07.04.2016	4.4	9.3	63.9	24.6
12.04.2016	4.5	9.3	73.4	26.4
15.04.2016	4.3	9.2	60.9	20.6
19.04.2016	3.8	8.7	57.3	17.7
22.04.2016	3.8	8.6	58.4	18.3
26.04.2016	4.1	9.1	59.3	21.9
29.04.2016	4.3	9.2	59.8	19.2
Limits^:-	80	80	100	60

PONDA (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.05.2016	4.3	8.8	60.7	19.1
06.05.2016	4.4	9.2	65.1	22.9
10.05.2016	4.5	9.3	85.6	26.5
13.05.2016	4.4	9.3	77.4	23.5
17.05.2016	3.8	8.7	33.9	10.8
20.05.2016	4.3	8.5	47.2	14.5
24.05.2016	4.1	9.1	34.4	10.4
27.05.2016	3.9	8.6	30.2	11.2
Limits^:-	80	80	100	60

PONDA (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.06.2016	3.4	8.6	45.4	16.2
04.06.2016	4.4	9.3	40.0	12.6
07.06.2016	4.1	9.5	47.1	15.0
10.06.2016	3.2	7.8	44.2	13.6
14.06.2016	4.2	9.3	60.2	23.4
17.06.2016	4.3	7.9	66.3	25.7
21.06.2016	2.0	4.5	51.0	16.9
24.06.2016	4.0	7.6	60.9	20.9
28.06.2016	3.0	6.0	47.2	15.8
Limits^:-	80	80	100	60

PONDA (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.07.2016	2.9	6.4	23.9	9.4
08.07.2016	4.2	8.2	54.4	19.4
12.07.2016	5.0	9.6	61.2	17.2
15.07.2016	3.6	7.6	42.8	14.2
19.07.2016	4.0	9.3	48.6	17.4
22.07.2016	4.2	9.9	57.2	19.0
26.07.2016	4.3	8.8	68.3	21.4
29.07.2016	3.1	6.5	54.1	17.8
Limits^:-	80	80	100	60

PONDA (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	3.5	8.6	54.3	17.0
06.08.2016	4.0	8.9	63.1	20.4
10.08.2016	2.5	6.6	35.3	11.3
13.08.2016	2.0	5.3	31.0	10.7
17.08.2016	3.9	8.8	50.5	16.4
20.08.2016	4.0	9.2	51.4	15.7
24.08.2016	3.6	9.4	51.0	18.9
27.08.2016	3.8	9.3	49.4	16.6
31.08.2016	3.9	9.5	59.8	19.0
Limits^:-	80	80	100	60

PONDA (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.09.2016	4.4	9.3	64.3	21.2
08.09.2016	3.6	9.3	40.7	12.6
11.09.2016	3.9	8.8	63.0	21.0
13.09.2016	3.9	8.8	45.9	15.4
16.09.2016	2.9	6.8	34.7	12.9
20.09.2016	2.0	6.4	29.4	11.0
23.09.2016	2.4	7.6	29.7	10.1
27.09.2016	3.6	8.2	58.9	19.3
30.09.2016	3.6	8.3	59.7	19.1
Limits^:-	80	80	100	60

PONDA (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.10.2016	4.7	9.9	40.4	14.6
07.10.2016	5.0	11.5	45.1	14.2
10.10.2016	3.3	8.7	20.9	7.3
12.10.2016	6.1	13.1	56.0	17.9
18.10.2016	8.3	17.3	87.0	25.3
21.10.2016	7.2	15.5	81.8	25.5
24.10.2016	13.6	16.3	110.7	36.9
30.10.2016	14.3	18.9	125.0	39.9
Limits^:-	80	80	100	60

PONDA (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	6.4	13.0	97.3	32.8
05.11.2016	5.6	11.5	82.9	25.4
08.11.2016	9.2	18.6	139.1	40.1
11.11.2016	8.4	17.4	135.3	36.8
15.11.2016	7.0	14.5	98.7	30.5
18.11.2016	8.2	14.1	134.6	41.9
22.11.2016	6.3	13.4	114.1	33.3
25.11.2016	8.7	17.7	130.1	39.7
29.11.2016	7.9	15.9	115.1	36.1
Limits^:-	80	80	100	60

PONDA (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.12.2016	9.8	15.5	96.4	31.8
06.12.2016	9.1	17.9	115.4	35.4
08.12.2016	9.7	19.7	124.1	37.4
13.12.2016	8.5	18.4	99.5	31.9
15.12.2016$	8.1	16.4	109.4	33.0
20.12.2016	8.9	19.0	129.4	40.7
22.12.2016	9.8	17.0	121.3	38.3
27.12.2016	8.0	16.9	120.3	38.2
29.12.2016	9.2	17.6	108.1	33.7
Limits^:-	80	80	100	60

PONDA (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.01.2017	10.5	17.5	111.1	34.3
05.01.2017	10.8	18.8	120.9	38.5
10.01.2017	11.3	18.4	88.1	28.0
12.01.2017	10.2	16.6	112.6	35.8
17.01.2017	10.4	17.1	98.1	30.4
19.01.2017	11.4	17.9	81.1	25.8
24.01.2017	11.9	18.1	113.6	35.8
27.01.2017	11.2	18.7	116.9	38.1
31.01.2017	12.5	19.6	121.8	38.5
Limits^:-	80	80	100	60

PONDA (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	9.7	17.2	115.9	36.4
04.02.2017	8.3	17.3	93.3	29.0
07.02.2017	8.4	17.9	100.2	31.7
09.02.2017	9.5	16.7	100.0	30.9
14.02.2017	8.5	16.0	94.7	29.9
16.02.2017	8.8	16.6	101.2	31.8
21.02.2017	9.8	17.0	95.3	31.2
23.02.2017	8.6	16.7	112.6	36.2
Limits^:-	80	80	100	60

PONDA (MARCH 2017)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.03.2017	8.9	18.2	131.3	41.0
04.03.2017	9.2	18.1	105.6	33.0
07.03.2017	8.8	19.1	152.3	48.5
09.03.2017	9.3	17.1	152.6	48.1
15.03.2017	8.6	17.5	107.5	33.7
19.03.2017	9.0	18.3	117.0	36.6
21.03.2017	9.9	17.6	103.3	33.7
23.03.2017	8.4	19.1	111.7	35.6
29.03.2017	8.9	19.4	102.5	32.2
31.03.2017	10.9	19.3	114.0	35.7
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Quepem Tilamol

QUEPEM-TILAMOL (APRIL 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.6	9.2	70.3	25.6
07.04.2016	4.2	9.0	58.2	19.1
12.04.2016	4.3	9.3	60.2	20.0
15.04.2016	4.3	9.0	58.7	21.9
19.04.2016	4.0	8.7	53.0	18.3
22.04.2016	4.5	9.3	67.2	23.7
26.04.2016	4.0	8.7	54.0	18.2
29.04.2016	4.2	8.8	57.2	19.9
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
13/05/2016	10	10.6	46	23.3
16/05/2016	9.9	11.2	59.1	32.9
20/05/2016	12.6	10.5	63.9	32.5
23/05/2016	8.2	11.7	52.8	22.5
26/05/2016	8.3	12.6	48.5	24.5
30/05/2016	8.9	11.1	42.2	20.9
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (JUNE 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/06/2016	5.9	8.6	27.4	16.5
06/06/2016	7.4	8	30.8	16
09/06/2016	5.9	9.3	28.7	15.3
13/06/2016	7.2	11.6	25.8	15.8
16/06/2016	6.9	10.9	24.9	15.3
20/06/2016	6.3	9.8	25.7	13.6
23/06/2016	6.2	9	31	16
27/06/2016	-	-	-	-
30/06/2016	6.9	9.5	26.8	14.9
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04/07/2016	6.9	11.4	31.5	14.2
07/07/2016	5.9	10.6	30.8	14
11/07/2016	6.7	11.8	28.7	14.2
14/07/2016	5.6	9.9	25.8	13
18/07/2016	7.6	10.4	24.9	13.3
21/07/2016	7.4	11.6	25.7	11.3
25/07/2016	7.7	10.4	31	12.5
28/07/2016	6.7	11.9	23.8	14.2
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (AUGUST 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/08/2016	6.5	10	19.3	17.7
04/08/2016	7.2	13.3	20	18.1
08/08/2016	5.3	11.1	18.2	20.3
11/08/2016	7	13.1	20	19.5
15/08/2016	6.8	13.1	15	17.5
18/08/2016	5.4	13.6	18.6	16.6
22/08/2016	7	11	16.2	15.4
25/08/2016	7.4	12.7	18.6	17.4
29/08/2016	9	15.5	15	18.3
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/09/2016	8.2	10.2	28.4	15.8
05/09/2016	7.4	9.6	28.5	14.6
08/09/2016	9.3	12.4	33.1	15.8
12/09/2016	9.5	11.1	34.7	13.3
15/09/2016	7.2	14.1	40.5	15.4
19/09/2016	7.5	12.4	32.9	20.3
22/09/2016	8.7	15.2	38.1	19.1
26/09/2016	7.7	11.5	33.1	16.4
29/09/2016	8.9	12	35.7	16.3
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (OCTOBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/10/2016	8.7	12.1	37.4	21.2
06/10/2016	7.4	11.3	34.4	19.6
10/10/2016	6.1	13	36.8	21.7
13/10/2016	8.4	12.6	30.6	17.9
17/10/2016	9	13.6	37.4	17.9
20/10/2016	5.5	11.7	40	20
24/10/2016	6.6	11.5	35.1	18.7
27/10/2016	6.1	13	42.5	21.7
31/10/2016	8	11.9	45.1	22.7
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/11/2016	9.3	13.9	38.1	19.6
07/11/2016	7.7	11.7	46.6	25.7
10/11/2016	8.1	12.5	39.8	20.8
14/11/2016	6.8	11.3	51.2	30.1
17/10/2016	8.9	11.6	45.4	28.3
21/11/2016	7.6	11.0	44.9	23.3
24/11/2016	8.4	11.4	46.4	25.0
28/11/2016	9.3	11.4	47.0	25.8
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (DECEMBER 2016)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/12/2016	7.2	12.2	60.3	30.8
05/12/2016	7.0	12.8	63.2	30.0
08/12/2016	5.7	10.7	63.6	30.4
12/12/2016	6.6	11.6	60.7	31.6
15/12/2016	7.6	12.2	62.4	33.3
19/12/2016	5.5	13.1	62.7	30.0
22/12/2016	6.2	12.1	62.6	29.1
26/12/2016	6.7	11.4	57.6	27.1
29/12/2016	6.3	12.8	64.5	30.8
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (JANUARY 2017)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/01/2017	5.7	11.9	70.8	33.7
05/01/2017	5.5	11.7	62.4	30.8
09/01/2017	5.3	12.1	71.5	31.7
12/01/2017	6.3	11.3	78.5	36.7
16/01/2017	6.5	13.3	75.5	32.9
19/01/2017	6.3	11.7	62.9	30.4
23/01/2017	6.5	13.9	63.7	28.3
26/01/2017	5.6	12.4	71.4	29.2
30/01/2017	6.6	13	72.7	28.7
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/02/2017	5.8	12.6	66.8	30.4
06/02/2017	6.1	12.2	64.8	26.7
09/02/2017	6.6	12.5	61.9	29.6
13/02/2017	4.9	10.8	68.0	31.2
16/02/2017	5.3	12.5	73.6	31.7
20/02/2017	5.9	12.6	66.0	29.2
23/02/2017	5.7	11.3	73.6	30.8
27/02/2017	6.3	12.2	67.0	27.1
Limits^:-	80	80	100	60

QUEPEM-TILAMOL (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/03/2017	7.0	14.0	74.9	32.1
06/03/2017	6.2	13.1	65.4	31.2
09/03/2017	5.5	12.6	68.7	31.7
13/03/2017	7.6	12.5	71.9	31.2
16/03/2017	6.1	12.3	65.1	32.5
20/03/2017	6.8	14.0	68.5	32.9
23/03/2017	6.2	15.4	73.1	29.6
27/03/2017	6.7	14.8	70.8	32.1
30/03/2017	6.3	13.8	68.9	30.8
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station : Sanguem

SANGUEM (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.5	9.2	65.7	23.4
07.04.2016	4.2	9.0	56.7	20.0
12.04.2016	4.2	9.1	55.2	17.9
15.04.2016	4.3	9.1	53.3	16.6
19.04.2016	3.8	9.1	46.1	13.9
22.04.2016	3.9	8.7	43.6	13.6
26.04.2016	4.1	8.7	51.5	15.7
29.04.2016	4.2	9.3	57.0	20.5
Limits^:-	80	80	100	60

SANGUEM (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/05/2016	6.6	10.8	67.8	24.8
06/05/2016	6.7	12.8	60.7	26.8
09/05/2016	7.4	11.8	57.1	21.6
13/05/2016	8.2	11.1	68.9	24.1
17/05/2016	7.5	11.2	52.4	26.3
20/05/2016	7.6	11.7	52.6	17.5
24/05/2016	7.1	11.1	53.5	20.9
27/05/2016	8.4	11.9	42.2	21.8
30/05/2016	8.5	11	48	22.3
Limits^:-	80	80	100	60

SANGUEM (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/06/2016	6.3	9.5	31.4	14.6
07/06/2016	6.4	11.8	32.9	16
10/06/2016	6.4	11.4	25.2	13.8
14/06/2016	5.9	9.6	32.1	14.8
17/06/2016	8.2	11.4	33.5	18.3
21/06/2016	5.6	10.5	36.6	19.4
24/06/2016	6.8	13.5	31.5	16
28/06/2016	5.9	12	33.7	16.5
Limits^:-	80	80	100	60

SANGUEM (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/07/2016	5.7	11.1	27.7	11.5
05/07/2016	5.1	12.3	26.5	13.3
08/07/2016	5.6	12.1	30.3	14.6
12/07/2016	6.7	11.4	24.7	11.7
15/07/2016	6.9	10.4	25.7	14
19/07/2016	6.9	11.8	25.9	13.3
22/07/2016	7.2	10.6	26.6	14.6
26/07/2016	7.1	10.9	24.9	11.6
29/07/2016	6.5	11.2	26.7	11.7
Limits^:-	80	80	100	60

SANGUEM (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/08/2016	8	14	24	21.6
05/08/2016	8.9	14.8	18.4	19
09/08/2016	8.8	14.8	22.6	20.7
12/08/2016	9	15	17.5	18.7
16/08/2016	8.9	13.8	16.4	17.6
19/08/2016	9	14	16.2	19
23/08/2016	7.2	13.5	22.5	22.5
26/08/2016	6.8	12.3	18.6	21.1
30/08/2016	7.5	12.6	18.7	19.2
Limits^:-	80	80	100	60

SANGUEM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/09/2016	7.7	12.9	29.7	20
06/09/2016	9.9	13.4	34.5	21.2
09/09/2016	10	13.2	32.6	21.2
13/09/2016	9.5	13.4	32.2	20
16/09/2016	9	14.7	29.7	19.2
20/09/2016	7.3	15.2	35.6	20.8
23/09/2016	7.2	15.4	36	22.5
27/09/2016	8	13.6	33	24
30/09/2016	7.9	13.8	32.4	20.7
Limits^:-	80	80	100	60

SANGUEM (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04/10/2016	6.9	11.8	34	17.5
07/10/2016	7.2	12.5	38.4	20.8
11/10/2016	7.3	14	36.6	19.2
14/10/2016	6.9	14.2	38.9	19.7
18/10/2016	7	13.1	39.7	19.7
21/10/2016	6.7	11.9	39.4	17.9
25/10/2016	5.7	11.6	38.9	19.2
28/10/2016	5.8	11	42	21.9
Limits^:-	80	80	100	60

SANGUEM (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/11/2016	5.7	12.1	43.3	20.0
04/11/2016	5.6	11.9	41.8	20.0
08/11/2016	6.4	11.0	47.5	23.3
11/11/2016	6.1	11.0	51.4	27.5
15/11/2016	7.7	11.7	43.8	23.3
18/11/2016	6.3	10.4	44.2	25.4
22/11/2016	6.8	12.2	45.0	25.8
25/11/2016	7.0	11.4	51.4	27.1
29/11/2016	7.9	12.6	44.7	23.3
Limits^:-	80	80	100	60

SANGUEM (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/12/2016	5.0	12.1	55.0	27.1
06/12/2016	6.3	12.8	53.8	25.4
09/12/2016	5.2	12.2	55.9	27.0
13/12/2016	6.6	12.5	56.1	27.9
16/12/2016	5.3	12.8	60.7	30.4
20/12/2016	6.1	12.1	50.7	27.5
23/12/2016	5.5	12.1	55.3	28.3
27/12/2016	6.0	12.6	52.4	28.3
30/12/2016	6.1	11.3	61	30.5
Limits^:-	80	80	100	60

SANGUEM (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/01/2017	5.1	11.8	68.7	31.7
06/01/2017	5.5	13.1	69.2	32.1
10/01/2017	6.2	12.3	62.6	30.4
14/01/2017	6.5	11.0	54.4	30.0
17/01/2017	6.9	12.5	63.5	31.2
20/01/2017	5.7	13.2	60.3	29.1
24/01/2017	6.6	11.6	62.4	28.3
27/01/2017	5.4	12.9	66.9	33.3
31/01/2017	6.2	12.5	72.2	31.2
Limits^:-	80	80	100	60

SANGUEM (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/02/2017	5.5	12.3	66.9	29.2
07/02/2017	5.5	11.7	67.7	27.1
10/02/2017	7.2	12.5	63.5	31.2
14/02/2017	6.2	11.0	69.9	31.2
17/02/2017	6.1	12.3	69.4	33.3
21/02/2017	6.2	12.5	65.7	30.8
24/02/2017	6.7	10.6	63.9	32.5
28/02/2017	6.0	10.9	70.1	29.6
Limits^:-	80	80	100	60

SANGUEM (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/03/2017	6.9	14.3	67.4	25.8
07/03/2017	6.7	13.1	63.2	31.2
10/03/2017	6.4	12.8	67.9	32.1
14/03/2017	6.5	12.5	69.5	31.7
17/03/2017	6.5	14.0	70.2	31.2
21/03/2017	6.0	11.8	64.1	30.4
24/03/2017	6.8	12.8	65.4	27.9
28/03/2017	6.5	12.7	67.2	30.0
31/03/2017	6.8	11.8	64.1	28.7
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station :Usgao

USGAO (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.5	9.3	74.1	27.5
09.04.2016	3.9	8.5	58.0	21.6
13.04.2016	4.3	9.1	59.2	18.0
16.04.2016	3.8	8.8	43.6	13.1
20.04.2016	4.2	8.9	59.7	18.1
23.04.2016	4.2	8.7	65.6	20.4
27.04.2016	4.2	9.2	73.2	24.4
30.04.2016	4.4	9.3	81.4	28.5
Limits^:-	80	80	100	60

USGAO (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.05.2016	3.6	8.8	58.8	22.8
07.05.2016	4.4	9.4	61.3	23.8
11.05.2016	4.2	9.1	46.0	13.9
14.05.2016	4.4	9.2	62.7	20.5
18.05.2016	3.9	8.4	39.8	12.3
21.05.2016	3.8	8.8	31.2	11.2
25.05.2016	4.0	8.7	43.6	13.3
28.05.2016	4.2	8.9	41.2	12.5
Limits^:-	80	80	100	60

USGAO (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.06.2016	3.6	8.3	72.5	22.6
04.06.2016	3.4	8.1	61.4	19.8
08.06.2016	3.9	7.9	32.2	10.0
11.06.2016	4.2	8.9	58.2	17.8
15.06.2016	3.7	8.5	47.9	15.4
18.06.2016	4.3	7.8	61.7	19.0
22.06.2016	2.0	4.5	62.3	22.2
25.06.2016	3.9	8.0	60.0	18.4
29.06.2016	2.6	4.5	52.0	15.6
Limits^:-	80	80	100	60

USGAO (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	4.4	9.5	54.6	18.5
09.07.2016	4.1	9.1	63.3	20.6
13.07.2016	3.9	8.6	56.2	18.5
16.07.2016	4.0	8.9	53.2	17.8
20.07.2016	4.0	9.3	59.1	21.5
23.07.2016	3.9	9.2	43.2	14.6
27.07.2016	2.9	5.5	32.6	11.2
30.07.2016	3.8	9.1	48.3	16.0
Limits^:-	80	80	100	60

USGAO (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	2.0	4.5	29.9	10.2
06.08.2016	4.0	8.3	43.3	15.4
10.08.2016	3.5	7.7	30.4	10.7
13.08.2016	2.4	4.5	27.9	10.0
17.08.2016	4.3	9.3	42.4	14.2
20.08.2016	3.9	8.7	36.1	12.6
24.08.2016	4.0	8.7	58.3	19.6
27.08.2016	4.0	9.0	65.2	21.6
31.08.2016	4.0	8.8	36.6	11.9
Limits^:-	80	80	100	60

USGAO (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	2.4	4.5	29.1	9.6
08.09.2016	4.0	9.3	41.8	13.6
10.09.2016	4.0	8.8	44.8	14.7
14.09.2016	3.5	7.9	34.9	13.4
17.09.2016	4.3	8.6	60.9	19.8
21.09.2016	4.2	9.0	44.3	16.4
24.09.2016	4.0	8.9	48.7	15.8
28.09.2016	3.5	7.7	38.8	13.3
30.09.2016	3.2	7.4	37.0	14.0
Limits^:-	80	80	100	60

USGAO (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.10.2016	7.0	14.6	50.4	17.3
08.10.2016	6.2	13.0	33.4	11.8
13.10.2016	8.1	17.1	76.7	25.1
15.10.2016	8.2	17.4	72.2	23.0
19.10.2016	9.2	19.1	83.7	25.7
22.10.2016	9.9	19.4	88.4	26.8
26.10.2016	9.3	18.2	99.8	32.1
29.10.2016	9.7	20.7	105.0	32.8
Limits^:-	80	80	100	60

USGAO (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	5.1	10.9	80.3	28.0
05.11.2016	5.1	11.1	68.3	23.3
10.11.2016	8.6	17.7	130.6	42.2
12.11.2016	7.0	15.6	111.9	35.5
16.11.2016	5.2	11.8	71.5	20.0
19.11.2016	8.1	17.4	125.0	36.4
23.11.2016	6.2	13.6	91.3	28.9
26.11.2016	6.6	14.5	93.0	31.1
30.11.2016	7.9	16.6	116.3	36.8
Limits^:-	80	80	100	60

USGAO (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	8.1	16.6	86.2	26.9
07.12.2016	8.5	17.8	110.5	34.4
09.12.2016	8.1	16.7	107.7	33.3
13.12.2016	6.6	16.0	99.5	32.8
16.12.2016	8.5	15.6	66.1	20.5
21.12.2016	9.0	17.6	103.6	31.3
23.12.2016	8.7	16.6	102.6	33.3
28.12.2016	8.3	17.9	100.8	32.6
30.12.2016	8.7	17.5	113.2	35.7
Limits^:-	80	80	100	60

USGAO (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04.01.2017	11.0	19.1	89.2	28.1
06.01.2017	10.6	18.9	109.6	34.4
11.01.2017	12.3	20.5	93.6	28.8
13.01.2017	11.7	20.4	98.0	32.8
18.01.2017	10.3	18.9	88.4	28.1
20.01.2017	10.1	15.6	108.8	32.3
25.01.2017	10.9	17.9	131.6	42.7
27.01.2017	11.3	18.5	124.7	39.9
31.01.2017	10.6	18.1	117.2	36.6
Limits^:-	80	80	100	60

USGAO (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02.02.2017	7.7	18.3	108.5	34.6
05.02.2017	7.3	16.4	98.3	31.3
08.02.2017	7.1	16.3	89.9	28.6
10.02.2017	7.6	15.7	70.2	22.4
14.02.2017	8.4	14.5	43.3	13.8
17.02.2017	7.0	16.8	85.8	27.1
21.02.2017	8.2	17.1	88.5	28.4
23.02.2017	9.2	17.8	101.9	32.4
Limits^:-	80	80	100	60

USGAO (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	8.9	17.4	138.3	44.1
04.03.2017	9.9	18.1	77.1	24.5
08.03.2017	10.1	17.7	104.3	33.3
10.03.2017	9.1	17.9	110.9	35.7
15.03.2017	11.7	17.7	68.0	22.2
17.03.2017	10.0	17.0	95.6	31.2
22.03.2017	10.4	18.5	107.3	34.4
24.03.2017	9.6	17.6	80.2	26.9
29.03.2017	8.3	16.6	89.3	29.3
31.03.2017	9.6	20.4	90.7	30.6
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station :Cuncolim

CUNCOLIM (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
05.04.2016	4.3	9.2	63.1	24.0
07.04.2016	4.7	9.5	74.0	33.9
12.04.2016	4.6	8.6	69.7	25.5
15.04.2016	4.8	9.8	82.3	28.2
19.04.2016	4.5	9.2	65.9	23.7
22.04.2016	4.2	9.0	54.8	18.8
26.04.2016	4.4	9.1	55.9	20.0
29.04.2016	4.1	9.2	42.7	15.7
Limits^:-	80	80	100	60

CUNCOLIM (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/05/2016	13.1	23.2	63.4	24.6
06/05/2016	12.3	14.5	91.3	20.4
09/05/2016	12.6	16.1	42.7	66.7
13/05/2016	13.5	25.4	90.1	51.2
17/05/2016	13.4	20.3	126	72.9
20/05/2016	13.1	21.7	78.7	38.3
24/05/2016	14.6	25.6	92.5	50.8
27/05/2016	12.7	19.6	98	48.4
30/05/2016	14.6	19.4	73.7	39.3
Limits^:-	80	80	100	60

CUNCOLIM (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/06/2016	19.5	19.7	51.1	22.1
06/06/2016	13.5	17.8	64.7	28.3
09/06/2016	10	18	48.6	24.3
13/06/2016	12	17.9	52.7	23.4
16/06/2016	13.4	18.7	47	40.2
20/06/2016	7.6	17.5	52	21.8
23/06/2016	8.8	19.1	49.5	25.1
27/06/2016	-	-	-	-
30/06/2016	8.8	18.5	53.6	31.4
Limits^:-	80	80	100	60

CUNCOLIM (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
04/07/2016	13.5	16	51.1	18.3
07/07/2016	13	15.8	62.7	17.5
11/07/2016	12.5	18.1	48.6	22.5
14/07/2016	12	17.2	52.8	18.7
18/07/2016	12.6	17.5	46.7	25.4
21/07/2016	14.1	14.3	52	22.9
25/07/2016	13.2	16	47	18.7
28/07/2016	15.7	16.7	60.7	22.1
Limits^:-	80	80	100	60

CUNCOLIM (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/08/2016	14.2	23.6	62.6	35.4
04/08/2016	13.1	20.4	69.5	35
08/08/2016	13.2	22.2	54	25
11/08/2016	12.5	23	63.3	41.2
15/08/2016	13.1	20	68	30.4
18/08/2016	13.6	19	60.5	27.9
22/08/2016	13.7	19.6	63.8	30
25/08/2016	13.4	22.7	79.3	35.4
29/08/2016	12.1	21.9	63.3	41.1
Limits^:-	80	80	100	60

CUNCOLIM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/09/2016	15.8	21.7	54.3	20
05/09/2016	14.5	20.7	61	20.4
08/09/2016	14.5	21.4	55.3	27.1
12/09/2016	14.5	22.9	35.1	32.9
15/09/2016	15.1	21.9	59	31.2
19/09/2016	15.5	25	64.3	31.1
22/09/2016	11.9	18.6	50	31.8
26/09/2016	10.5	22.2	56.3	32.1
29/09/2016	10.1	20	53.6	26.9
Limits^:-	80	80	100	60

CUNCOLIM (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/10/2016	11.8	18.1	61.1	31.7
06/10/2016	12.4	18.6	62.4	34.2
10/10/2016	12	18.6	55.5	30
13/10/2016	11.8	17.4	50.5	32.1
17/10/2016	12.6	19.1	72	36.4
20/10/2016	12.6	21	68.9	34.6
24/10/2016	12.7	16.5	64.8	36.2
27/10/2016	11.4	18.3	70.3	34.6
31/10/2016	13	19	61.9	32.5
Limits^:-	80	80	100	60

CUNCOLIM (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03/11/2016	8.6	12.5	95.7	44.2
07/11/2016	11.1	15.8	64.3	37.1
10/11/2016	11.4	14.8	70.6	35.8
14/11/2016	7.4	13.4	84.8	51.2
17/11/2016	10.7	14.2	51.0	26.7
21/11/2016	11.1	15.1	64.6	33.3
24/11/2016	11.0	15.4	42.5	22.9
28/11/2016	12.4	16.8	79.8	46.7
Limits^:-	80	80	100	60

CUNCOLIM (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01/12/2016	7.4	14.5	104.1	10.3
05/12/2016	8.4	14.1	78.1	78.0
08/12/2016	7.8	13.2	122.5	115.0
12/12/2016	8.7	14.2	83.4	83.0
15/12/2016	8.1	15.1	111.1	107.0
19/12/2016	8.0	15.0	96.0	96.0
22/12/2016	9.0	13.2	129.2	137.0
26/12/2016	10.6	13.7	87.3	87.0
29/12/2016	8.7	13.4	86.4	96
Limits^:-	80	80	100	60

CUNCOLIM (JANUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/01/2017	7.1	12.2	94.5	56.9
05/01/2017	5.9	12.9	90.8	59.2
09/01/2017	7.3	14.7	82.6	50.8
12/01/2017	6.7	14.7	95.8	56.2
16/01/2017	6.0	14.0	113.0	66.7
19/01/2017	6.7	12.7	93.0	58.3
23/01/2017	6.4	13.4	96.1	60.8
26/01/2017	7.0	15.1	116.8	66.1
30/01/2017	9.2	14.0	91.7	58.3
Limits^:-	80	80	100	60

CUNCOLIM (FEBRUARY 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/02/2017	5.8	10.1	73.0	38.3
06/02/2017	6.2	11.5	81.4	38.7
09/02/2017	6.3	12.1	73.9	37.1
13/02/2017	5.5	13.9	83.3	42.9
16/02/2017	6.7	13.6	81.2	46.7
20/02/2017	6.3	12.5	90.0	47.1
23/02/2017	6.0	12.4	89.6	46.7
27/02/2017	5.9	13.3	100.1	49.2
Limits^:-	80	80	100	60

CUNCOLIM (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
02/03/2017	9.6	14.8	89.8	48.7
06/03/2017	9.4	13.8	90.0	45.8
09/03/2017	10.4	15.1	88.0	46.2
13/03/2017	8.8	13.1	101.7	52.5
16/03/2017	9.9	13.3	88.2	45.0
20/03/2017	10.7	13.8	93.7	51.7
23/03/2017	8.9	14.6	82.6	41.7
27/03/2017	8.6	15.0	89.7	46.2
30/03/2017	11.2	14.5	95.3	52.1
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Station :Tuem

TUEM (APRIL 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.04.2016	4.4	9.3	85.2	27.1
09.04.2016	4.5	9.2	88.6	33.5
13.04.2016	4.4	9.2	84.1	25.9
16.04.2016	4.2	8.8	77.2	23.3
20.04.2016	4.2	8.9	71.2	21.9
23.04.2016	3.8	8.8	54.3	18.1
27.04.2016	4.1	8.8	64.2	20.3
30.04.2016	4.2	8.7	68.5	22.9
Limits^:-	80	80	100	60

TUEM (MAY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
18.05.2016	4.5	9.6	83.3	30.2
21.05.2016	4.4	8.6	75.0	26.4
25.05.2016	4.1	9.1	71.9	21.7
28.05.2016	4.0	9.1	73.9	22.7
Limits^:-	80	80	100	60

TUEM (JUNE 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.06.2016	4.0	8.9	62.6	23.3
04.06.2016	4.2	8.9	42.9	16.2
08.06.2016	3.7	8.6	50.3	16.1
11.06.2016	3.4	7.6	64.6	23.3
15.06.2016	3.6	8.3	37.8	11.6
18.06.2016	3.2	6.7	34.1	10.4
22.06.2016	2.0	4.5	34.3	12.7
25.06.2016	2.0	7.4	55.4	21.4
29.06.2016	2.7	6.7	56.5	20.5
Limits^:-	80	80	100	60

TUEM (JULY 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
06.07.2016	3.5	8.0	50.6	17.3
09.07.2016	4.3	9.2	42.8	13.5
13.07.2016	4.1	9.4	80.9	26.0
16.07.2016	4.2	8.7	79.2	26.5
20.07.2016	2.5	5.6	28.9	10.1
23.07.2016	4.6	9.9	66.1	23.6
27.07.2016	3.7	8.7	42.8	13.0
30.07.2016	4.0	9.1	59.1	19.0
Limits^:-	80	80	100	60

TUEM (AUGUST 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.08.2016	4.0	8.6	58.7	17.7
06.08.2016	4.0	8.4	66.1	20.4
10.08.2016	4.4	8.8	67.2	21.2
13.08.2016	4.0	8.5	66.2	21.9
17.08.2016	3.7	7.7	59.3	19.1
20.08.2016	2.5	5.7	44.9	14.6
24.08.2016	3.9	8.6	52.4	17.9
27.08.2016	4.3	8.9	52.1	16.5
31.08.2016	3.1	6.4	45.3	14.9
Limits^:-	80	80	100	60

TUEM (SEPTEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.09.2016	4.1	9.0	46.8	15.0
07.09.2016	3.9	8.3	43.3	14.1
10.09.2016	3.9	9.1	43.5	15.7
14.09.2016	3.4	8.8	35.6	10.5
17.09.2016	4.3	9.1	54.0	17.0
21.09.2016	2.5	5.6	23.4	7.7
24.09.2016	2.0	4.5	29.5	10.8
28.09.2016	3.9	8.4	44.9	15.9
Limits^:-	80	80	100	60

TUEM (OCTOBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.10.2016	5.8	12.1	43.2	15.8
05.10.2016	4.3	9.2	24.4	8.0
08.10.2016	4.3	9.5	23.7	8.4
13.10.2016	4.1	9.2	23.4	7.8
15.10.2016	3.2	6.9	16.0	7.1
19.10.2016	3.6	8.4	20.5	7.6
22.10.2016	4.4	9.5	23.5	7.8
26.10.2016	3.7	8.6	20.9	7.3
29.10.2016	2.6	5.9	14.9	6.2
Limits^:-	80	80	100	60

TUEM (NOVEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.11.2016	9.1	18.9	132.6	38.6
05.11.2016	8.8	18.1	117.4	35.8
09.11.2016	9.5	18.5	118.9	33.6
12.11.2016	8.5	17.2	114.1	28.6
20.11.2016	7.2	14.5	79.4	22.4
23.11.2016	5.8	12.3	54.8	19.5
26.11.2016	8.2	16.9	113.4	38.2
30.11.2016	7.0	13.7	102.8	35.3
Limits^:-	80	80	100	60

TUEM (DECEMBER 2016)				
Sampling Date	SO2 µg/m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
03.12.2016	8.3	16.6	35.6	11.2
07.12.2016	9.4	21.3	118.4	36.6
09.12.2016	8.8	17.8	93.8	28.7
14.12.2016	8.3	18.2	60.3	18.9
16.12.2016	8.2	16.3	56.1	17.3
21.12.2016	9.3	17.5	85.6	23.3
23.12.2016	8.9	17.0	74.6	22.8
28.12.2016	8.7	17.8	74.1	20.8
30.12.2016	9.3	18.7	83.5	25.6
Limits^:-	80	80	100	60

TUEM (JANUARY 2017)				
Sampling Date	SO2	NOX	PM10	PM2.5
04.01.2017	12.1	16.7	111.0	35.8
06.01.2017	10.0	18.3	122.2	40.1
11.01.2017	11.0	16.0	82.1	26.0
13.01.2017	10.7	19.3	85.8	27.7
18.01.2017	12.6	17.1	86.9	28.8
20.01.2017	10.5	17.4	105.2	35.1
25.01.2017	10.5	16.7	81.2	27.0
27.01.2017	10.9	16.6	85.6	27.7
31.01.2017	11.5	19.8	78.7	26.0
Limits^:-	80	80	100	60

TUEM (FEBRUARY 2017)				
Sampling Date	SO2	NOX	PM10	PM2.5
02.02.2017	9.8	16.8	76.7	23.9
05.02.2017	10.5	20.5	47.4	15.7
08.02.2017	9.8	18.1	74.4	25.9
10.02.2017	9.7	18.1	59.4	19.8
15.02.2017	9.2	16.9	96.2	30.5
17.02.2017	9.8	16.7	91.4	28.8
21.02.2017	10.3	15.5	66.8	21.6
23.02.2017	10.6	18.3	72.3	23.3
Limits^:-	80	80	100	60

TUEM (MARCH 2017)				
Sampling Date	SO2 µg/ m3	NOX µg/m3	PM10 µg/m3	PM2.5µg/ m3
01.03.2017	9.6	17.2	169.2	53.1
03.03.2017	9.0	17.7	60.1	19.9
08.03.2017	7.7	18.8	63.4	20.7
10.03.2017	10.2	18.2	58.8	18.9
15.03.2017	10.3	20.0	42.9	14.4
17.03.2017	10.8	20.3	49.0	15.7
22.03.2017	8.5	16.3	62.7	20.4
24.03.2017	11.2	19.1	65.5	21.5
29.03.2017	10.1	19.9	57.9	18.4
31.03.2017	8.3	18.2	56.7	18.5
Limits^:-	80	80	100	60
^ schedule VII EPR,1986 as amended O_3 & CO: 1 hr average SO_2,Nox,PM10, PM 2.5 & Pb: 24 hrly average BDL- Below Detection Limit				

Annexure VI

CLOSURE DIRECTIONS ISSUED UNDER THE WATER ACT AND THE AIR ACT

Sr. No.	Name & Address of the unit	Date & Order No.	Remark
1	The Collector(South), South Goa District, Collectorate Bldg, Margao-Goa. / M/s. LittleHearts, C/o/. Armando Barreato, R/o. H. no. 409/A, Suclem, Curtorim, Salcete-Goa.	09/05/2016, 2907	The Collector of South Goa District, Margao is hereby directed to seal the unit immediate of M/s. Little Heart located at sy no. 568/2, Curtorim Goa, opertaed by Mr. Armando Barretto,. R/o. H. no 409/A, Suclem, Curtorim Goa, and submit a compliance report within 15 days from the receipt of the direction.
2	Mr. Joaquim George, M/s. Open Air Hall, Vodlem, Near Ideal High School, Taleigao-Goa.	09/05/2016, 2951	The unit is hereby directed to close/suspend the operation within 15 days from the date of receipt of the direction.
3	M/s. Dattaraya Fabrication Workshop, Plot No. 104/04, H. no. 207, Amboi, Sao Maias, Tiswadi-Goa.	03/06/2016, 4852	The unit is hereby directed to stop all activity/operation in the closed attaches to your house and submit a compliance report to his with a period of 7 days.
4	M/s. Anjuna Plaza, Sy no. 160/1, H no. 692, Demello waddo, Anjuna, Bardez-Goa.	21/06/2016 5904	The application submitted by the unit hereby rejected and further directed to stop the operation of the unit with immediate effect and submit a compliance report to this office.
5	M/s. Magistic Buildcon Pvt. Ltd, Calangute, Bardez-Goa.	26/09/2016,, 11572	The unit is hereby directed to close/suspend the operation of your unit within 7 days from the receipt of this direction till such time as you obtained CTO from the Board.
6	M/s. Floating Pontoon Jetty, Sy. no.,31/4, Virlosa, Brittona, Bardez-Goa.	18/10/2016, 13049	The Consent to Operate under vide Order no. 5/5647/16-PCB/CI/1245 dt. 07/03/2016 to the unit is revoked with immediate effects. Further the unit is directed to close/suspend the operation of your unit within 15 days
7	M/s. White Rock, Opp. Goa Housing Board, Bordem, Bicholem-Goa.	16/09/2016, 10963	The unit is hereby directed to close/suspend the operation within 7 days from the date of receipt of the direction or till the unit obtain CTO of the board.
8	M/s. Decent Fast Food Centre, Gokulwadi, Sanquelim, Bicholim-Goa.	02/11/2016, LD-50	The unit is hereby directed to close/ suspend the operation of the unit within a period of 7 days from the date of receipt of the direction till such time you obtain CTO from the Board.
9	Mr. Sitakant V Chari, C/o. Kamleshwar Workshop, H. no. B-32, Korlim, Mapusa-Goa.	17/11/2016, 14755	the unit is here by directed to immediately stop/suspend /close the operation of the unit within 7 days till such such time unit complied the measures given by the board

10	M/s. Five Star Chicken, Shop no.1, Airport Residency, Airport Road, Chicalim, Vasco-Goa.	03/02/2017, 19571	the unit is hereby directed to immediately stop /close he operation of your unit with immediate effects.
11	M/s. Brat Agro Private Ltd, Plot no. L-51A, Phase II D, Verna Industrial Estate, Verna , Salcete-Goa.	08/02/2017, 19859	The unit is directed to suspend the operation of unit within 7 days . Further I is also directed to suspend the operation till such time you obtain valid consent to operate from the Board.
12	M/s. La La Land Nature Reosrt, Colomb Bay Beach, Canacona-Goa.	01/03/2017, 21064	The unit directed to suspend the operation within 15 days from the receipt of this direction or ill such time unit obtain valid CTO of the Board.
13	M/s. Brat Agro Private Ltd, Plot no. L-51A, Phase II D, Verna Industrial Estate, Verna , Salcete-Goa.	08/02/2017, Leg/19859	The unit is hereby directed to suspend the operation of the unit within 7 day until unit obtained valid consent of the Board.

ANNEXURE VII

Annual Returns of E- Waste for the year 2015 - 2016

1	Name of the State/Union territory	Goa
2.	Name & address of the State Pollution Control Board/ Committee	Goa State Pollution Control Board
3.	Number of authorised Producers, Collection Centres, registered Dismantler and Recyclers For management of e-waste in the State or Union territory under these rule	a) Producers – 13 nos. b) Collection Centres- 06 nos. c) Dismantler and Recyclers- Nil
4.	Categories of waste collected along with their quantities on a monthly/yearly average basis.	a) IT waste- 67675.0 Kg/annum b) Non-IT- 73530.0 Kg/annum
5.	A summary Statement on Category wise product wise quantity of e-waste Collected	a) IT wastes- 67675.0 Kg/annum, which include Computers, CPU, UPS, Laptops, Printers etc. b) Non-IT waste- 73530.0 Kg/annum, which includes consumers E-waste i.e. House hold items.
6.	Mode of treatment with details	The E waste collected from the State of Goa is transported outside States for processing.
7.	Brief details of collection, dismantling and Recycling facilities	The Goa State Pollution Control Board has granted authorization for 06 nos. Of Collection Centres. Apart from the collection centres few of the units are disposing their E-waste to Central Pollution Control Board authorized recyclers/ Dismantlers. There are no dismantler/ recycling facilities established within the State of Goa.
8.	Any other information	
9.	Certified that the above report is for the period from	1st April 2015 to 31st March 2016

ANNEXURE VIII

Annual Returns of Bio-medical waste Management for the year 2016

Hospitals & Nursing homes (HCF's) in village/town/city as per schedule VI (1)	Total no. of HCF's irrespective of number of patients treated (2)	Total no. of Beds (3)	No. of HCF's required to take authorisation (4)	No. of HCF's granted authorisation (5)	No. of HCF's having treatment and disposal facilities (6)	Total no. of captive treatment equipment installed by HCF's (i.e excluding CBWTF) (7)					No. of CBWTF (8)		No. of HCF's which are utilising CB-WTF's (9)	Total Qty of BMW generated kg/day (10)	Total Qty of BMW treated kg/day (11)	No. of Health Care Facilities violated BMW Rules (HCF) (12)		Total no. of Show Cause Notices/Directions issued to defaulter HCF (13)	
						Incinerator													
						With Air Pollution Control Device (APCD)	Without APCD	No. of Autoclave	No. of Microwave	No. of Hydroclave	No. of Shredder	In operation	Under Construction				HCF	CB-WTF	HCF	CB-WTF
A) HCF in town with population of 30 lakhs and above	0																		
B) HCF in town with population below 30 lakhs: a) with 500 beds and above	1	5181	440	434	1	1	NIL	186	-	-	-	NIL	NIL	NIL	9586	9586	1	-	1	-
b) with 200 beds but less than 500 beds	3																		
c) with 50 beds but less than 200 beds	17																		
d) with less than 50 beds	431																		
C) All other institutions generating bio-medical waste not included in A) and B)	7																		
Total	434	5181	440	434	1	1	NIL	186	-	-	-	NIL	NIL	NIL	9586	9586	1	-	1	-

ANNEXURE IX

ANNUAL RETURNS OF PLASTIC WASTE FOR THE YEAR 2015 - 2016 (MANAGEMENT AND HANDLING) RULES 2011 IN STATES/UTS .

Name of SPCB/ PCC	Estimated Plastic Waste generation Tons Per Annum(TPA) or TPD	No. Of registered Plastic Manufacturing/Recycling (including multilayer, compostable) units (Rule 9)			No. Of unregistered Plastic Manufacturing/recycling units in residential area	Explicit Pricing of carry bags (Rule 10)	Detailed Status of Plastic Waste Management (PWM) (Rule 6-a to h) eg. Collection, segregation, disposal (Co-processing, road construction etc, conversion of plastic waste into fuel etc.	Partial Ban on usages of Plastic Bags (through executive order) (please mention name tourist places, pilgrimage centres historical places etc.	Complete ban on use of plastic bags including multilayer sachets on Gutkha etc.	Status of Constitution of State Level Advisory Body (Rule 11)	No. Of violation and action taken against manufacturing stock and use of thin (<40µ) carry bags and sachets etc. (Rule 5)	Submission of Annual Report by SPCBs/ Municipal Bodies.
1	2	3			4	5	6	7	8	9	10	11
		Plastic units	Compostable Plastic units	Multilayer Plastic units								
Goa State Pollution Control Board	Approximately 8.824MT/ month (reused in process/sold to scrap dealer	24	Nil	Nil	Nil	Goa No-Biodegradable Act	MOU signed with M/s. ACC, Wadi Vasvadatta cement works for co-processing of plastic waste generated in the State of Goa	No	yes	Monitoring cum Working committee on solid waste Management & High level Task Force	Nil	Yes

ANNEXURE X

Annual Returns of Lead Acid Batteries

GOA STATE POLLUTION CONTROL BOARD

Status of Lead Acid Battery (APRIL 2015-MARCH 2016)

Sr. No	Type of Category	Total No	Total no. Production/Imported/Consumption/Recycled of LAB/(Qty)	Sale of Lead Acid Batteries in units	Total collection of Lead Acid Batteries in units	Annual Returns submitted	Action taken	Remarks
1	Manufacturer/ Reconditioner	8	2650 Nos	NA	1577 nos	Yes	Units which have not submitted returns have been directed to do so.	Battery Scrap has been sent to 1.Sterling Lead Pvt. Ltd, Kolhapur, 2. New Metal Refinery, Navi-Mumbai. 3. Chloride Metals Ltd.
2	Assembler	0	0	NA	0	No		
3	Collection Centre	1	Nil	NA	Nil	No		
4	Dealer	35	NIL	66784 nos	7914 nos	Yes		
5	Importer	Nil	Nil	Nil	Nil	NA		
6	Blk. Consumer	31	4142 Nos	Nil	NA	Yes		
7	Auctioneer	Nil	NA	NA	NA	NA		
8	Recycler	Nil	NA	NA	NA	NA		

1. Details of action initiated/taken against illegel/unauthorised recycler and smelter of used lead acid batteries:
   No case of such illegelity has been reported/observed by the Board
2. Percentage of compliance achieved in the state for the collection of used batteries as per schedule I of the rules : 12%

SAVE OUR ENVIRONMENT! ACT NOW!

The Goa State Pollution Control Board urges the industries in Goa to be conscious and responsible about emissions and waste water effluents. We also urge the people of Goa to take up the cause of reducing pollution around them by acting responsibly in their day-to-day lives.

People of Goa, it's time we start

- Avoid using your vehicle when you can walk or cycle, it's healthier.
- Car pool (a group of commuters traveling together) when you can.
- Choose local public transport.
- Plan your trips. Save fuel.
- Conserve water.
- Conserve electricity.
- Reduce pollution by using cleaner / greener technology.
- Waste not. Reduce. Reuse. Recycle. Often!
- Encourage using local products and reusable goods.
- Avoid burning garbage.
- Stop smoking.
- Wash only full loads in your washing machine.
- Throw rubbish into waste paper bins. Not finding one is no excuse for littering.
- Reduce plastic bag usage when shopping. Carry your own cloth/ paper bags.

So Breathe! It's time for a wind of Change!

GOA STATE POLLUTION CONTROL BOARD

Dempo Towers, 1st floor, Panaji, Goa 403 001
Tel: 91-0832-2438567, 2438528, 2438563, 2438550 **Fax:** 0832-2438528
Email: goapcb@rediffmail.com **Website:** goaspcb.gov.in

Photograph by Conrad Braganza -Mapuça

The **River Tern** is a beautiful member of the terns family with a grayish white body and a black patch on the head making it appear as if the bird is wearing a black wig. The bright yellow beak and a swiftly moving tail adds to the attractiveness of the species. River Tern feeds by plunge-diving for fish, tadpoles and aquatic insects in rivers, lakes and water tanks. This species breeds from March to May in colonies in less accessible areas such as sandbanks in rivers.

Sadly, the River tern has been classified "Near Threatened" on the International Union for Conservation of Nature (IUCN) Red List. Its population is estimated to be about 50,000 globally.

Garganeys are smallish dabbling ducks, slightly larger and stockier than Teals. Breeding males can be distinguished by their reddish-brown heads marked with a broad white eye stripe that curves down towards their necks. Female and immature Garganeys resemble female Teals, through they are slightly paler overall.

The River Terns and the Garganeys has seen its numbers decreasing due to pollution of their habitats, habitat destruction and the larger effects of climate change are among the most prominent factors responsible for this condition.

Save Our Natural Habitats !

GOA

GOA STATE POLLUTION CONTROL BOARD

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