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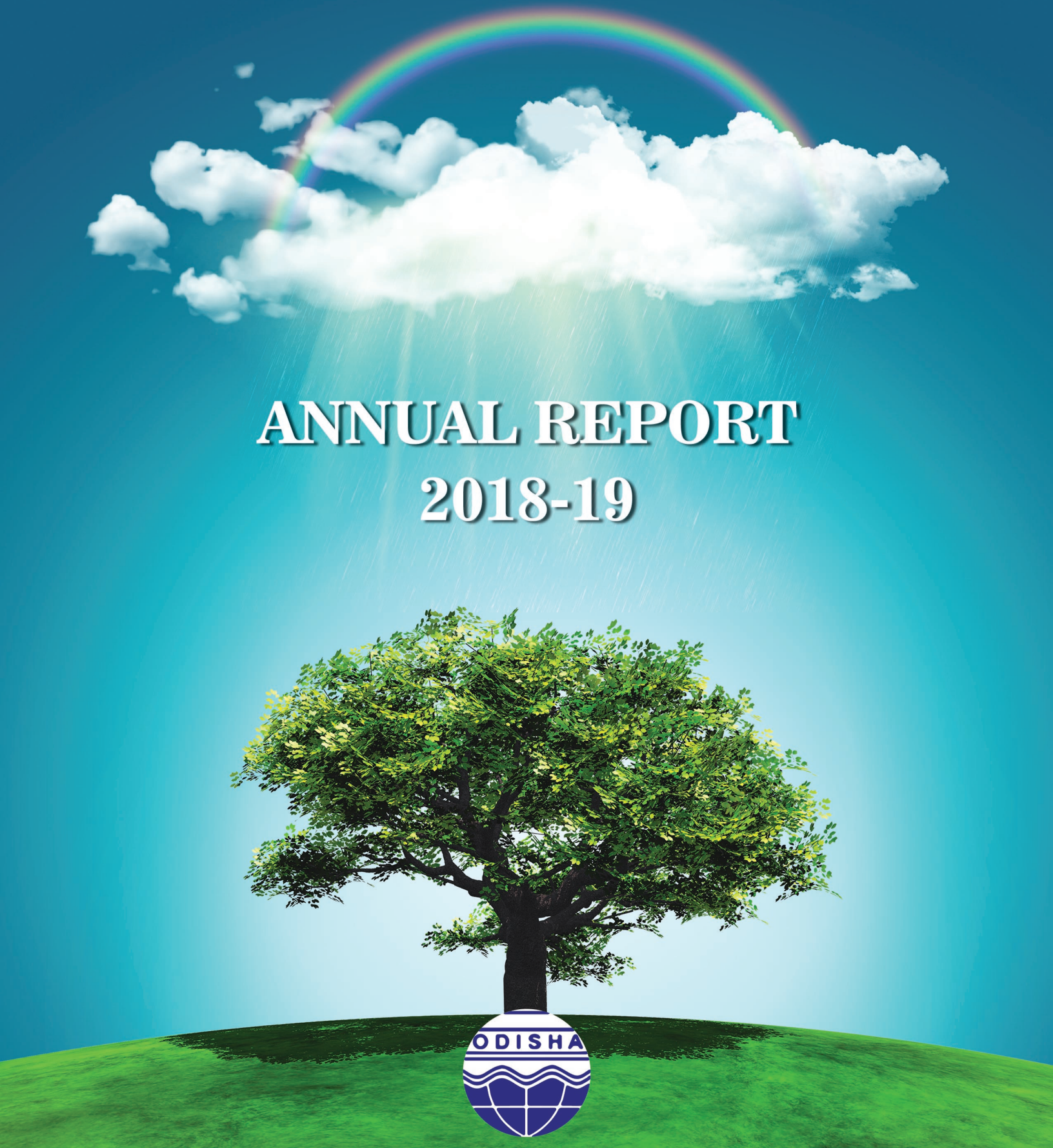

STATE POLLUTION CONTROL BOARD, ODISHA
A/118, NILAKANTHA NAGAR, UNIT-VIII
BHUBANESWAR

ANNUAL REPORT

2018-2019

STATE POLLUTION CONTROL BOARD, ODISHA

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Highlights of Activities of the State Pollution Control Board, Odisha

The State Pollution Control Board (SPCB), Odisha was constituted in July, 1983 and was entrusted with the responsibility of implementing the Environmental Acts, particularly the Water (Prevention and Control of Pollution) Act, 1974, the Water (Prevention and Control of Pollution) Cess Act, 1977, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986. Several Rules addressing specific environmental problems like Hazardous Waste Management, Bio-Medical Waste Management, Solid Waste Management, E-Waste Management, Plastic Waste Management, Construction & Demolition Waste Management, Environmental Impact Assessment etc. have been brought out under the Environment (Protection) Act. The SPCB also executes and ensures proper implementation of the environmental policies of the Union and the State Government. The activities of the SPCB broadly cover the following:

- Planning comprehensive programs towards prevention, control or abatement of pollution and enforcing the environmental laws.
- Advising the State Government on any matter concerning prevention and control of water and air pollution.
- Environmental Monitoring and Research.
- Creating public awareness.

The achievements and activities of the Board during period of report are as follows.

1. Industrial Pollution Abatement and Control through Consent Administration

Improvement in compliance to pollution control norms, guidelines and regulations has been witnessed consistently through vigorous surveillance, regular inspections and monitoring, stipulation of a series of guidelines and directives. The Board has also taken the following measures/ activities;

(i) The Board has constituted different technical committees for considering consent applications of various projects for establishment.

(ii) Implementation of the on-line consent management system (from receipt of application to grant of consent order) for all industries, mines processes on-line authorization management for Hazardous Waste, Solid Waste and Bio-Medical Waste.

(iii) Implementation of GPRS based real time data acquisition system with Y-Cable for online stack, ambient air quality and waste water monitoring network for highly polluting large scale industries and mines in order to keep the regulator and industries alert. So far online monitoring and data transmission system has been installed in 150 industries and 24 mines.

(iv) The Fly Ash Resource Centre (FARC) has been setup in the State Pollution Control Board for promoting safe management and utilization of fly ash in the State. This center has prepared guidelines on utilization of fly ash in various sectors and it also co-coordinates between the Users and Thermal Power Plants. In addition, FARC is also organizing Workshops and Interaction meets among the stakeholders for enhancing fly ash utilization. The utilization of fly ash was 82.71%, during the reporting period, as against 80.74% the preceding year.

(v) Initiatives have been made to facilitate bulk utilization of other industrial solid wastes like dolochar, phospho-gypsum, blast furnace slag, anode butt, ferro-manganese sludge in different sectors like brick making, road construction, cement manufacturing and power generation etc.

(vi) The bedded health care establishments have been brought under the Consent administration as per the provisions of Water (Prevention & Control of Pollution) Act, 1974 in order to dispose highly contaminated waste water in an environmentally sound manner.

(vii) To study the cause of high ambient temperature and design remedial measures, the Board has instituted Heat Island study for Angul-Talcher area through IIT, Delhi. Similar study for Ib Valley-Jharsuguda area has been instituted by DFID in association with SPCB. The study was conducted by TERI, Delhi. Both these studies have been completed.

(viii) In order to augment the capacity of the Board in the area of coastal environmental monitoring, the World Bank assisted Integrated Coastal Zone Management Project (ICZMP) is being implemented. Office of the Pilot Executing Agency (PEA) of the Board has been operating in Central Laboratory Building, Patia, Bhubaneswar. The coastal water over a stretch of about 80 km from Paradeep to Dhamra is being monitored. 73 sampling locations have been selected for the entire monitoring area, out of which 32 are along the Mahanadi transect, 17 in Dhamra transect and 24 in Gahiramatha- Bhitarkanika transect. In total 1111 nos. of water samples and 77 nos. of sediment samples have been collected and analyzed during the reporting period.

(ix) **Blue Flag Beach Certification:**

Twelve beaches in the country are being developed by the Society for Integrated Coastal Management (SICOM), an Environment Ministry's body working for the management of coastal areas, in accordance with the Blue Flag standards. The beach of Chandrabhaga (Konark), Paradeep and Puri in the coast of Odisha were the nominated sites on pilot basis among others, to be selected and one out of the three will be decided to get the Blue Flag certification-the tag given to environment-friendly and clean beaches, equipped with amenities of international standards for tourists.

As per the proposal of Govt. of Odisha and MoEF & CC, GoI, the OSPCB has been involved in conducting detail survey of environmental background of these coasts.

In total, 120 samples from Puri Sea beach at 10 different locations, 60 samples from Paradeep sea beach at 10 different locations and 246 samples from Chandrabhaga beach were collected and analyzed for 09 parameters.

(x) The Sea Worthy Pollution Monitoring Vessel (Sagar Utkal) with an in-built Laboratory, procured under the ICZM Project has been registered with Mercantile Marine Department (MMD) of DG Shipping, Government of India. It would also cater services to other agencies like oceanographic researchers, universities etc. for survey and monitoring in coastal stretch of Odisha up to 12 nautical miles.

(xi) The Board has granted consent with stipulations of appropriate pollution control measures to 949 industries, hotels, mineral stack yards, mineral processing units, railway sidings, stone crushers, brick kilns and DG Sets (as stand by) etc. for their establishment.

(xii) Consent to operate has been granted to 2404 industries, mines, hotels, hospitals, mineral stack yards, mineral processing units, country liquor manufacturing units, railway sidings, stone crushers, brick kilns, DG Sets (as stand by), housing projects and mineral based industries etc. during the reporting period. Board has issued show cause notices to 401 units and closure direction to 200 units. Consent to operate of 79 units have been refused.

(xiii) All the Urban Local Bodies have been directed to seek consent and submit time bound action plan for construction of sewage treatment plant. Show cause notice has been issued to 02 nos. of ULBs for non compliance of presceibed standards for discharge of sewage effluent.

(xiv) The Board has conducted public hearings for 45 nos. of major industrial / mining / development of projects requiring environmental clearance from MoEF and CC, Govt. of India/ State Environment Impact Assessment Authority (SEIAA), Odisha.

(xv) 2494 industrial wastewater samples, samples from 1013 stack emissions, 1921 ambient air samples and 48 solid waste/ hazardous waste/soil samples/plant samples have been collected and analyzed.

(xvi)**Launching of Star Rating Programme:**

The Star Rating Programme has been launched by Honourable Chief Minister of Odisha on 17th September, 2018 by unveiling a new website (www.ospcb.info) where citizens can access the information. Also, Hon'ble Chief Minister appreciated the efforts of State Pollution Control Board, Odisha quoting this initiative as an excellent example of **3Ts-Technology, Teamwork and Transparency.**

2. Regulation of Hazardous Waste Management

The Board has granted authorization to 113 hazardous waste generating units for collection, storage, treatment and disposal of hazardous wastes whereas show cause notice has been issued to 03 nos. of units, authorization of 01 unit has been refused and authorization of 04 nos. of units has been suspended for violation under the said Rules. 26 nos. of actual users inside Odisha and 25 nos. of actual users outside Odisha have been authorized by the Board during the reporting period for utilization of hazardous wastes.
As per the provisions of Sec -23 of Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and CPCB guidelines on "Implementing Liabilities for Environmental Damages due to Handling and disposal of Hazardous Wastes and Penalty", the Board has recommended for levying of financial penalty against the industries for violation of different provisions of the Rule.

3. Management of Lead Acid Batteries

The Board has received 136 half yearly returns from Manufacturer, Re-conditioner, Assembler, Dealer, Bulk consumer, Auctioner, Importer and Recycler for smooth management and handling of batteries (Lead-Acid) from battery units under the Provisions of the said Rules.

4. Management of Bio-Medical Waste

The Board has granted authorization to 651 Health Care Facilities (HCF) under the provisions of the Bio-Medical Waste Management Rules, 2016 with conditions for proper management, segregation, handling, treatment and disposal of biomedical wastes. Show cause notice to 31 units, refusal of authorization to 01 HCF and direction to 07 units have been issued due to improper management of biomedical wastes.

5. Management of Plastic Waste

The Board is consistently vigilant on carry bag manufacturing units for their compliance with the statutory provisions of the Plastic Waste Management Rules. So far, 13 plastic product manufacturing units (08 producers, 04 brand owners and 01 re-processor) have been registered with the Board during the reporting period.

6. Management of Electronic Waste

The Board has issued authorization to 04 nos. of E-waste dismantling units during the reporting period.

7. Management of Municipal Solid Waste

The Board has issued show cause notice to 01 non-complying Urban Local Body during the reporting period. In total 29 ULBs are having valid authorization from the Board and rest ULBs have been instructed to apply for authorization.

8. Legal Activities

The Board has filed 331 cases in appropriate legal forum and 247 cases have been disposed during the reporting period.

9. Right to Information

Under the Right to Information Act, 2005, the Board has disposed 531 applications by providing information.

10. Disposal of Public Complaints

The Board has addressed 351 Public Complaints on various environmental issues during the reporting period.

11. Planning and Monitoring

For prevention and control of pollution, the Board has undertaken following activities:

- Board is regularly monitoring the river water quality at 129 stations on 11 major river systems of the State i.e., Mahanadi, Brahmani, Baitarani, Rushikulya, Subarnarekha, Nagavali, Budhabalanga, Kolab, Vansadhara, Indravati and Bahuda. Water quality is assessed in respect of 32 parameters under National Water Quality Monitoring Programme (NWMP). Besides these, water quality of Taladanda Canal at six locations, Puri canal at three locations, religious ponds such as Bindusagar (Bhubaneswar) at its four bathing ghats and five ponds in Puri town such as Narendra, Markanda, Indradyumna, Swetaganga and Parbati Sagar, one pond in Jeypore town, one pond in Angul town, lakes such as Chilika (two locations) & Anshupa (four locations), Tampara (one location) and coastal water quality at Puri, Gopalpur and Paradeep on the Bay of Bengal has also been monitored.

  Monitoring of ground water quality at 48 stations of 11 towns i.e., Cuttack, Bhubaneswar, Puri, Berhampur, Sambalpur, Paradeep, Angul, Talcher, Ib valley-Jharsuguda area, Sukinda and Balasore has also been conducted in respect of 32 parameters.
- Bio-monitoring at 21 stations of 08 major rivers i.e. Mahanadi, Brahmani, Rushikulya, Subernarekha, Budhabalanga, Kolab, Vansadhara and Nagabali has been monitored to assess the biological health of these river systems.
- To assess the impact of mass bathing during Kartika Purnima on the water quality of Mahanadi and Kathajodi rivers, water quality monitoring at eight major bathing ghats of these rivers along Cuttack city was conducted.
- Surface water quality of 5 stations on Atharabanki creek and ground water quality at 3 stations in the peripherals of Phosphatic Fertiliser Units and water samples from 07 test wells as well as samples from 05 wastewater discharging points of the fertilizer producing units at Paradeep has been monitored on quarterly basis to assess fluoride contamination in the area.
- Water quality of Ganda Nallah and Kharasrota river has also been monitored at seven stations on regular interval to assess the impact of waste water discharge from the Industrial Units in Kalinganagar area to the Nallah.
- Water quality of Damasala river at nine stations in Sukinda Chromite Mine area has been monitored on regular interval to assess the hexavalent chromium content in river water.
- Surface water quality in and around M/s Vedanta Aluminium Limited, Jharsuguda has been monitored at fourteen locations to assess the fluoride contamination in the area.
- Impact of idol immersion after Durga puja on water quality of Kuakhai and Daya river (in Bhubaneswar city) and Kathajodi river (in Cuttack city) has been investigated. No significant impact due to immersion activities on the water bodies was observed.
- 4851nos. of water samples under National Water Quality Monitoring Programme (NWMP), National River Conservation Programme (NRCP), State Water Quality Monitoring Programme (SWMP) and different projects including other water samples and 69 nos. of Bio-monitoring samples have been analysed by the Board.

- Ambient air quality (AAQ) at 37 stations of 17 important towns and industrial areas of Angul, Balasore, Berhampur, Bhubaneswar, Bonaigarh, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rajgangpur, Rourkela, Sambalpur & Talcher has been monitored by the Board under National Ambient Air Quality Monitoring Programme (NAMP)/ State Ambient Air Quality Monitoring Programme (SAMP). Ambient air quality in 14 towns at 28 Stations has been assessed in respect of 04 parameters namely PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2) and Nitrogen Oxides (NO_X) whereas, at 09 stations in Bhubaneswar, Puri and Konark, ambient air quality has been assessed in respect of 08 parameters like PM_{10}, $PM_{2.5}$, SO_2, NO_X, NH_3, O_3, Pb & Ni. In total, 1921 ambient air quality samples, 11,325 no. of AAQ samples under NAMP/SAMP projects have been collected and analysed by the Board. 1013 nos. of stacks have been monitored during the reporting period.
- Study on ambient noise levels in pre & during celebrations of Dashera in 13 towns /cities & during Deepawali at 14 towns/cities have been conducted in Industrial, Commercial, Residential and Silence Zones such as Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur.
- Technical support to Commissionerate of Police, Bhubaneswar has been provided for performance evaluation of 71 numbers of sound limiters of different Band parties in respect of noise [limited to 65 dB(A)].
- To assess the impact of bursting of fire crackers during Deepawali, the ambient air quality with respect to parameters like SO_2, NO_X, PM_{10} & $PM_{2.5}$ have been monitored in pre- and on the day of Deepawali at 53 locations in 14 towns/ cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur. In addition to this, ambient air quality monitoring was conducted at five municipal cities like Berhampur, Bhubaneswar, Cuttack, Rourkela & Sambalpur from 31st Oct, to 14th Nov, 2018 in compliance to the orders of Hon'ble Supreme Court.

12. Energy Policy Institute at the University of Chicago (EPIC) India and State Pollution Control Board, (SPCB), Odisha Partnership Project.

Launching of Star Rating Programme :

The Star Rating Programme was launched by Honorable **Chief Minister of Odisha on 17th September 2018** at Odisha Secretariat by unveiling a new website (www.ospcb.info) where citizens can access the information. Hon'ble Chief Minister also appreciated the efforts of State Pollution Control Board, Odisha quoting this initiative as an excellent example of **3Ts- Technology, Teamwork and Transparency.** As on 31st March, 2019 a total of 100 industries falling under 17 categories of highly polluting industries have come on board for the Star Rating Programme.

13. Board's Publications

The Board has published the following Books & Reports during April, 2018 to March, 2019.

- Three volumes of Newsletters "Paribesh Samachar" i.e. (Jan–Mar. 2018, April-June, 2018, July to December, 2018).
- "Environmental Status Report- 2015-2017" for the coastal stretches of Paradeep, Gahirmatha-Bhitarkanika and Dhamra in the Bay of Bengal, India by ICZMP, SPCB, Odisha.
- Report card on Paradeep-Gahirmatha-Dhamra Ecosystem-2017 by ICZMP, SPCB, Odisha
- "Mangroves Atlas of Bhitarkanika" by ICZMP, SPCB, Odisha in association with Department of Biotechnology & Bioinformatics, Sambalpur University, Odisha

14. Awareness Programmes

- For creation of awareness amongst general public, the Board regularly publishes advertisements carrying messages on various environmental issues in different periodicals / newspapers / souvenirs.
- The World Earth Day was celebrated on 22nd April, 2018 by Regional Offices of State Pollution Control Board, Odisha.
- The Board observed the World Environment Day on 5th June' 2018 through 12 Regional Offices to create awareness on environmental protection. Messages on protection of environment were propagated to the public through meetings, mass campaign, paintings, debates & planations programmes etc.
- The 35th Foundation Day of the Board was observed on 15th Sept, 2018 at Jaydev Bhawan, Bhubaneswar with release of newsletter and books. Prof. Satyaban Jena, Retd. Professor of Chemistry, Utkal University, Vanivihar delivered Prof. M.K. Rout Memorial Lecture on **Green Chemistry**.
- The International Coastal Clean-up Day was observed by the Board on the Sea Beaches of Puri, Konark, Chandipur, Gopalpur & Paradeep on 15th Sept, 2018 for creation of mass awareness on protection and management of environment involving District Administration, different NGOs & Volunteers.
- During Deepawali festival awareness campaign was organized in & around Bhubaneswar and Cuttack for creating awareness among the public on effect of crackers on air pollution & noise pollution.

15. Human Resource Development

- The Board has conducted various programmes for imparting training to various stakeholders on pollution control and environment protection and also deputed its officials on exposure training and to acquire knowledge in the above field.
- The Board has imparted training on "Monitoring and Analysis of Environmental Parameters from 8th to 30th November, 2018 to 20 numbers of participants under "Green Skill Development Programme (GSDP)" organized by the Centre for Environmental Studies (CES). The participants were given demonstration and hands-on training for sampling and analysis of water and wastewater samples, ambient air monitoring and analysis, source emission monitoring and analysis, noise monitoring, soil and hazardous waste sampling and analysis. Senior officers also contributed through class room teachings.
- Imparted training on "Ambient air pollutants, effect and its measurement" to 81 numbers of MBBS students of All India Institute of Medical Science, Bhubaneswar.
- Four numbers of 1st year M.Sc. (Environmental Science) Students of Pondicherry University were guided for conducting their summer-internship work in the Central Laboratory.
- Eight numbers of M.Sc (Environmental Science) Students of Utkal University were guided for conducting their Dissertation work in the Central Laboratory.
- Imparted training on "Prevention & control of Vehicular Pollution" to 541 numbers of Traffic personnel at Traffic Training Institute, Bhubaneswar.

CHAPTER – I

INTRODUCTION

1.1 CONSTITUTION OF THE BOARD

The Odisha State Prevention and Control of Pollution Board was constituted in pursuance of sub-section (1) of section 4 of the Water (Prevention and Control of Pollution) Act, 1974, vide Notification No. 1481-VII-HI-11/83 (Vol. II)-S.T.E., dt. 15.7.1983 in the erstwhile Department of Science, Technology & Environment, Government of Odisha. The Board was re-designated as State Pollution Control Board, Odisha vide Govt. Notification No. Env.-E (F)/8/89/1882 F&E, dt.16.07.1999.

1.2 FUNCTIONS AND RESPONSIBILITIES OF THE BOARD

The constitution and functions of the Board are clearly spelt out in the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981. The Board is entrusted with the responsibility of implementation of Environmental Laws, particularly the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986 and a number of Rules and Notifications issued thereunder as amended from time to time.

Responsibilities of the Board, however, can broadly be classified into the following four main categories:

1. To plan a comprehensive programme for prevention, control or abatement of pollution and enforce the environmental laws
2. To advise the State Government on any matter concerning prevention and control of water and air pollution
3. To conduct Environmental Monitoring and Research
4. To create public awareness

In addition, the Board is also expected to execute and ensure proper implementation of the Environmental Policies of the Union and the State Government.

1.3 ENVIRONMENTAL LAWS

The major Acts and Rules / Notifications issued thereunder, with which the Board is entrusted for implementation and execution are as follows:

1. The Water (Prevention and Control of Pollution) Act, 1974
2. The Air (Prevention and Control of Pollution) Act, 1981
3. The Environment (Protection) Act, 1986
4. The Public Liability Insurance Act, 1991
5. The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 amended as the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
6. The Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells Rules, 1989
7. The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
8. The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

9. The Biomedical Waste (Management and Handling) Rules, 1998 amended as the Biomedical Waste Management Rules, 2016.
10. The Municipal Solid Waste (Management and Handling) Rules, 2000 amended as the Solid Waste Management Rules, 2016.
11. The Noise Pollution (Regulation and Control) Rules, 2000
12. The Ozone Depleting Substance (Regulation and Control) Rules, 2000
13. The Batteries (Management and Handling) Rules, 2001
14. The Environment Audit Notification, 1993
15. The Fly-ash Utilization Notification,1999 and amended thereof
16. The Environment Impact Assessment Notification, 2006
17. The Plastic Waste (Management and Handling)(Amendment)Rules, 2011 amended as the Plastic Waste Management Rules, 2016
18. The E-Waste (Management and Handling) Rules, 2011 amended as the E-Waste (Management) Rules, 2016.
19. The Construction & Demolition Waste Rules, 2016.

1.4 LOCATIONS AND MAILING ADDRESSES OF BOARD'S OFFICES

Headquarters of the State Pollution Control Board, Odisha is located at Paribesh Bhawan, A/118, Nilakantha Nagar, Bhubaneswar in Khordha District. The Board has established its state-of-art Central Laboratory at B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar.

The jurisdictions, functions, role, responsibilities and powers of Regional Officers of all the 12 Regional Offices have been defined vide Board's Office Order No. 16908, dtd.19.09.2013. The mailing addresses, Telephone/Fax Nos., E-mail/website and jurisdiction of the Head Office, the Central Laboratory and Regional Offices are given in Table-1. The locations of twelve Regional Offices of State Pollution Control Board are illustrated in Odisha Map in Fig. 1.

Table – 1: Address, Telephone / Fax, e-mail / Website and Jurisdiction of State Pollution Control Board, Odisha

Sl. No.	Address	Telephone / FAX / e-Mail / Website	Jurisdiction (Districts)
		HEAD OFFICE	
1	State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-8, Bhubaneswar-751 012	(0674) 2561909, 2562847 Fax- (0674) 2562827, 2560955 E-Mail:paribesh1@ospcboard.org Website : www.ospcboard.org	Whole of the Odisha State
2	Central Laboratory, State Pollution Control Board, Odisha, B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar	E-Mail : centrallab@ospcboard.org Website : www.ospcboard.org	Whole of the Odisha State
		REGIONAL OFFICES	
1	Regional Office, Angul S-3/3, Industrial Estate, Hakimpada, Angul- 759 143	Tel - (06764) 236389 Fax - (06764) 237189 E-mail:rospcb.angul@ospcboard.org	1) Angul 2) Dhenkanal

Sl. No.	Address	Telephone / FAX / e-Mail / Website	Jurisdiction (Districts)
2	Regional Office, Balasore, 160, Sahadev Khunta, Balasore – 756001	Tel/Fax-(06782) 265110 Email:rospcb.balasore@ ospcboard.org	1) Balasore 2) Bhadrak 3) Mayurbhanj
3	Regional Office, Berhampur, New Divisions Office, IDCO, Berhampur Division, Industrial Estate, Berhampur – 760008, Ganjam	Tel- (0680) 2281075 Fax- (0680) 2280139 Email:rospcb.berhampur@ ospcboard.org	1) Ganjam 2) Gajapati 3) Phulbani 4) Nayagarh
4	Regional Office, Bhubaneswar, B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar	R.O Tel - (Mob) 09438883947 E-mail : rospcb.bhubaneswar@ ospcboard.org Website: www.ospcboard.org	1) Puri 2) Khordha
5	Regional Office, Cuttack, Plot No. 586, Surya Vihar, Link Road, Cuttack – 753 012	Tel/Fax-(0671) 2335478 E-Mail : rospcb.cuttack@ ospcboard.org	1) Cuttack
6	Regional Office, Keonjhar At - Baniapat, College Road, Keonjhar-758 001	Tel / Fax - (06766) 259077 E-Mail: rospcb.keonjhar@ ospcboard.org	1) Keonjhar
7	Regional Office, Rayagada 287/A, Kasturi Nagar, Rayagada – 765 001	Tel-(06856) 223073 Fax-(06856) 224281 E-Mail: rospcb.rayagada@ ospcboard.org	1) Rayagada 2) Koraput 3) Nawarangpur 4) Malkangiri 5) Kalahandi
8	Regional Office, Rourkela Town Engineering Office Premises, Sector – 5, Rourkela – 769 002	Tel - (0661) 2646736 Fax – (0661) 2648999 E-Mail: rospcb.rourkela@ ospcboard.org	1) Sundergarh except Himgiri block of Sundergarh district (Basundhara mining areas) 2) Deogarh
9	Regional Office, Sambalpur, Plot No.1070 Hospital Road, Modipara, Sambalpur-768 002	Tel- (0663) 2541910 Fax – (0663) 2541978 E-Mail:rospcb.sambalpur@ ospcboard.org	1) Sambalpur 2) Bargarh 3) Boudh 4) Bolangir 5) Nuapada 6) Sonepur
10	Regional Office, Jharsuguda, Plot No. 370/5971, At – Babubagicha (Cox Colony) St. Mary's Hospital Road, PO-Industrial Estate, Dist.-Jharsuguda- 768203	Tel- (06645) 273284 Fax – (06645) 2732294 E-Mail: rospcb.jharsuguda@ ospcboard.org	1) Jharsuguda 2) Himgiri block of Sundergarh district
11	Regional Office, Kalinga Nagar, At - Dhabalagiri, Near OMC office, J.K. Road, P.O: Ferro Chrome Plant, Jajpur - 755019	Mob-9438883955 E-mail: rospcb.kalinganagar@ ospcboard.org	1) Jajpur
12	Regional Office, Paradeep, At- Centre for Management of Coastal Eco-system (CMCE), Plot No. 47, Nuasandhakuda, Near Panthaniwas, Marine Road, Paradeep-754142	Mob-9438883963 E-Mail: rospcb.paradeep@ ospcboard.org	1) Jagatsinghpur 2) Kendrapara

Fig. 1 Map Showing 12 Regional Offices of State Pollution Control Board, Odisha

CHAPTER – II

CONSTITUTION OF THE STATE BOARD

2.1 As per the provisions of sub-section 2 of section 4 of the Water (Prevention and Control of Pollution) Act, 1974 and under sub-section 2 of section 5 of the Air (Prevention and Control of Pollution) Act, 1981, the State Board shall consist of the following members, namely:

i. A Chairman (either whole-time or part-time as the State Government may think fit), being a person having special knowledge or practical experience in respect of matters relating to environment protection or a person having knowledge and experience in administrating institutions dealing with the matters aforesaid, to be nominated by the State Government;

ii. Such number of officials, not exceeding five, to be nominated by the State Government to represent that Government;

iii. Such number of persons, not exceeding five, to be nominated by the State Government from amongst the members of the local authorities functioning within the State;

iv. Such number of officials, not exceeding three, to be nominated by the State Government to represent the interest of agriculture, fishery or industry or trade or any other interest which, in the opinion of the State Government, ought to be represented;

v. Two persons to represent the companies or corporations owned, controlled or managed by the State Government, to be nominated by that Government;

vi. A full time Member Secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the State Government

2.2 In exercise of the powers conferred under Sub-Section (1) of Section 4 of the Water (Prevention & Control of Pollution) Act, 1974 and Section 5 of the Air (Prevention & Control of Pollution) Act, 1981, Government in the Forest & Environment Department, Odisha constituted the present Board vide Notification No. 25653-Env-II-39/2018-F&E dated 29.11.2018 for a period of three years with the following members.

A. Chairman

Chairman, State Pollution Control Board, Odisha.

Sri R.Balakrishnan, IAS (From 30.11.2015 to 30.11.2018)

Sri A. P.Padhi, IAS (From 01. 12.2018 to 31.3.2019 and contd.)

B. Official Members

1. Secretary to Government, H & UD Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
2. Secretary to Government, Industries Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
3. Secretary to Government, Steel and Mines Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
4. Director (Environment), Forest & Environment Department, Government of Odisha or his nominee
5. Director, Factories & Boilers, Government of Odisha or his nominee

C. Members Representating Local Authorities

1. Bhubaneswar Municipal Commissioner, Bhubaneswar Municipal Corporation, Bhubanewswar
2. Chairman / Executive Officer, Paradeep Municipality
3. Chairman / Executive Officer, Jharsuguda Municipality
4. Chairman / Executive Officer, Talcher Municipality
5. Chairman / Executive Officer, Barbil Municipality

D. Non-Official Members

1. Prof. Atanu Kumar Pati, Presently Vice Chancellor, G M University, Sambalpur
2. Dr. Ajit Kumar Patnaik, IFS (Retd), Former PCCF, Chief Executive, Chilika Development Authority
3. Dr. G.K. Roy, Retired Professor of Chemical Engineering & Former Director, NIT, Rourkela.

E. Members Representating Companies & Corporations

1. Managing Director, Odisha Mining Corporation Ltd., Bhubaneswar
2. Managing Director, Industrial Infrastructure Development Corporation (IDCO), Bhubaneswar

F. Member Secretary

Member Secretary, State Pollution Control Board, Odisha.

Sri Debidutta Biswal, IFS (29.07.2016 contd.)

CHAPTER - III

CONSTITUTION OF COMMITTEES

3.1 CONSENT COMMITTEE

3.1.1 Constitution of Consent Committees

The Board has re-constituted consent committee vide office order No. 355 dt. 08.01.2019 in pursuance to partial modification of order no.12547,dt.20.07.2015 with the members enlisted in Table-3.1 for establishment of various projects mentioned below:

- 17 categories of highly polluting industries having investment of ₹ 50 crores or more.
- Coal, Bauxite, Iron Ore, Manganese, Limestone, Dolomite & Chromite Mines.
- All Sponge Iron Plants.
- Hazardous Waste recycling and re-processing unit including TSDF irrespective of any investment.
- Reclamation of low lyling area / abandoned quarries with ash outside the plant premises for land measuring more than 10 Acres (Consent to Establish to be granted with the approval of Member Secretary and same to be taken to the Consent Committee for ratification on case to case basis as per Office Order no. 11047 / IND-IV-PCP-FARC-120, dated. 21.08.2017).

Members of the Committee are given in Table 3.1.

Table - 3.1 Members of the Consent Committee

1.	Member Secretary, SPC Board, Odisha, Bhubaneswar	Chairman
2.	One of the sectoral expert each of different Technical Committee constituted by the Board (such as Mining, Iron & Steel, Power, Chemical & Allied, Petroleum refinery, Aluminum Smelter and Port Projects) in case of large industrial projects whose investment is ₹1000 crores or more or mining project with lease hold area 1000 ha. or more. (As per Table No.3.2)	Member
3.	External Expert Members to be nominated by the Chairman, SPC Board in specific cases, if required.	Member
4.	Secretary, Industries Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
5.	Secretary, Steel & Mines Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
6.	Secretary, Water Resources Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
7.	Director -cum-Special Secretary to Govt. Forest & Env.Deptt. Govt. of Odisha or his representative	Member
8.	Director, Factories & Boilers, Odisha, Bhubaneswar or his representative not below the rank of Deputy Director	Member
9.	Chief Conservator of Forest (Nodal), Odisha or his nominee not below the rank of D.F.O. in the office of PCCF, Odisha, Bhubaneswar	Member

10.	Concerned District Collectors or their nominees	Member
11.	Branch Head dealing the subject of Hazardous Waste SPC Board, Odisha, Bhubaneswar.	Member
12.	Branch Head dealing with Consent to Operate, Mines, SPC Board, Bhubaneswar.	Member
13.	Branch Head dealing the subject of environmental monitoring, SPC Board, Odisha, Bhubaneswar	Member
14.	Branch Head of Consnet to Establish Cell, SPC Board, Odisha, Bhubaneswar	Convener

The Technical Committee has been merged with Consent Committee vide Office Order No. 12547, dtd.20.07.2015.

Table – 3.2 Members of the Technical Committee

Sl. No.	Technical Committee constituted for	Sectoral Experts
1.	Mining Projects whose leasehold area is 1000 Ha or more. (vide Office Order No. 10729, dt. 03.05.07)	1) Prof. S. Jayantu, Dept. of Mining Engineering, NIT Rourkela 2) Sri B. N. Mishra, Ex-Director (T) MCL, CMD, EDL, Bhubaneswar
2.	Iron and Steel Projects (vide Office Order No. 27958, dt. 16.11.06 & No. 10735 dt. 03.05.2007	1) Dr. Somanath Mishra, Ex- Principal, REC, Rourkela, 2) Dr. R. C. Gupta, Professor and Head, Department of Metallurgical Engineering , Institute of Technology, Banaras Hindu University
3.	Power Projects (vide Office Order No. 10761, dt. 03.05.07)	1) Sri B. C. Jena, Ex-CMD, Grid Corp. of Odisha Ltd, Bhubaneswar 2) Mr. G. S. Panda, Ex. Head TTPS, Sailashree Vihar, Bhubaneswar
4.	Chemical and Allied industries (vide Office Order No. 10850, dt. 05.05.07)	1) Prof. G. K. Roy, Dept. of Chemical Engineering, NIT, Rourkela 2) Sri R. K. Dash, Former Executive Director, PPL & OCFL, VIM 484 (near post office), Sailashree Vihar, Bhubaneswar
5.	Petroleum Refineries (vide Office Order No. 10761, dt. 03.05. 07)	1) Dr. M. O. Garg, Director, Institute of Petroleum, Dehradun 2) Prof. P. Rath, HOD, Department of Chemical Engineering, NIT, Rourkela
6.	Aluminium Smelter (vide Office Order No. 14791, dt. 22.06.07)	1) Dr. R. K. Paramguru, Scientist – G, Head, Hydro & Electrometallurgy Dept., Institute of Minerals & Materials Technology (formerly known as Regional Research Laboratory), Bhubaneswar, Odisha 2) Sri R. N. Jena, Ex-General Manager, NALCO Smelter Plant, Angul
7	Port Projects (vide office order No. 16387,dt. 05.07.2008)	1) Dr. R. Sundarvadivelu, Professor and Head, Department of Ocean Engineering, Indian Institute of Technology, Chennai – 600 036 Or Dr. Sannasi Raj, Associate Professor, Department of Ocean Engineering, Indian Institute of Technology, Chennai – 600 036 2) Sri Dibakar Mohapatra, (Retd. Chief Engineer, Paradeep Port Trust), Plot No. 7A, Brahmeswar Bag,Tankapani Road, Bhubaneswar

3.1.2. Consent Committee Meetings

Tweleve Consent Committee meetings were held for consideration of 112 proposals for establishment during the financial year 2018-19. The details are given in Table - 3.3.

Table – 3.3 Details of Consent Committee Meeting

Sl. No.	Date of Consent Committee meeting	No. of cases disposed
1.	26.4.2018	07
2.	29.5.2018	05
3.	29.6. 2018	06
4.	28.7.2018	15
5.	31.08.2018	09
6.	11.10.2018	09
7.	14.11.2018	14
8.	28.12.2018	19
9.	31.1.2019	18
10.	27.2.2019	10
Total		**112**

3.1.3. Constitution of Internal Consent Committee

In pursuance of office order No.352 dt. 08.01.2019, an internal consent committee has been reconstituted with the members reflected in Table 3.4 to evaluate the applications for grant of consent to establish (NOC) for the following projects.

- 17 categories of highly polluting industries having investment of less than ₹ 50 crores.
- Other than 17 categories of polluting industries (Red and Orange Category) having investment of ₹ 50 crores or more.

Table – 3.4 Members of the Internal Consent Committee

1.	Branch Head dealing with Consent to Establish, SPC Board, Odisha, Bhubaneswar	Chairman
2.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with Consent to Establish.	Member
3.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with Consent to Operate of Industry / Mines.	Member
4.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with the subject of Hazardous Waste.	Member
5.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with the subject of Environmental Monitoring.	Member
6.	Branch officer of Consnet to Establish Cell, SPC Board, Odisha, Bhubaneswar	Convenor

No internal consent committee meeting was held during the financial year 2018-19.

3.1.4 Constitution of Technical Committee for issue of "No Increase in Pollultion Load" Certificate for Changes in Plant Configuration and Product Mix for the Project.

In pursuance to MoEF&CC, Govt.of India Notification vide So.3518(E) dtd.23.11.2016, State Pollution Control Board has constituted a Technical Committee with the following members to examine the application and to make recommendations for issue of "No Increase in pollution load" certificate for changes in plant configuration & product mix for the project.

Table - 3.5 Members of Technical Committee for issue of "No Increase in Pollultion Load" Certificate

Sl. No.	Name	Designation
1.	Member Secretary, State Pollultion Control Baord, Odisha	Chairman
2.	Dr. Sanjat Ku. Sahu, Professor, Dept. of Env. Science, Sambalpur University, Sambalpur (Nominated by F&E Department).	Member
3.	Dr. Himanshu B. Sahu, Associate Professor, Dept. of Mining Engineering, NIT, Rourkela (Nominated by F&E Department).	Member
4.	Dr. Chitta Ranjan Mohanty, Associate Professor, Dept. of Civil Engineering SSUT, Burla (Nominated by F&E Department).	Member
5.	Dr. Abhaya Ku Dalai, Former Reader in Botany, Ravenshaw University, 6GH/1150, C-15, Sector-9, CDA, Cuttack-753014, (Nominated by F&E Department).	Member
6.	Sri R.C. Saxena, Regional Director, CPCB, Kolkata or his nominee not below the rank of Addl. Director.	Member
7.	Sr. Env. Scientist, L-I/Sr. Env.Engineer, L-I, SPC Board, dealing with Consent to Establish of Industries / Mines	Member
8.	Sr. Env. Scientist, L-I/Sr. Env. Enginer, L-I, SPC Board,dealing with Consent to Operate of Industries	Member
9.	Sr. Env. Scientist, L-I/Sr. Env.Engineer, L-I, SPC Board, dealing with Consent to Operate of Mines	Member
10.	Sr. Env.Engineer, L-II, SPC Board, dealing with Consent to Establish of Industries & Mines.	Member

3.2 PURCHASE COMMITTEE FOR SCIENTIFIC STORE

3.2.1 Constitution of the Purchase Committee

In pursuance of the provision Under Section 9 of the Water (Prevention & Control of Pollution) Act, 1974 and Under Section 11 of the Air (Prevention & Control of Pollution) Act, 1981, a purchase committee has been constituted for the financial year 2018-19 with the following members for the purchase and maintenance jobs of scientific items of the Central Laboratory as well as Regional Offices laboratories of the Board valuing ₹ 15,000.00 and above is given in Table 3.6.

Table - 3.6 Members of the Purchase Committee for ₹ 15,000.00 and above.

1.	Member Secretary, State Pollution Control Board, Odisha	Chairman
2.	Dr. B.S.Jena, Sr. Principal Scientist, Institute of Materials and Minerals Technology (IMMT), Bhubaneswar.	Member

3.	Financial Adviser-cum-Addl.Secretary to Govt., Forest & Environment Dept., Govt. of Odisha, Bhubaneswar	Member
4.	Director or his representative, Directorate of Export Promotion & Marketing, Bhubaneswar	Member
5.	Senior Environmental Scientist (L-I), Central Lab.,State Pollution Control Board, Odisha, Bhubaneswar	Member
6.	Accounts Officer, State Pollution Control Board, Odisha, Bhubaneswar	Member
7.	Env. Scientist, (Purchase), State Pollution Control Board, Odisha, Bhubaneswar	Member Convenor

Technical Committee has been constituted vide order No. 924 dt.28.06.2018 for the specification of various equipments & instruments and to study the nature of requirement of different chemicals, glass wares, plastic wares, filtration products etc. required by the laboratory in Table - 3.7.

Table – 3.7- Members of the Technical Committee

1.	Senior Environmental Scientist (L-I), State Pollution Control Board, Odisha	Chairman
2.	Dr. S.G. Kumar,Senior Scientist, Regional Plant Resource Centre, Bhubaneswar	Member
3.	Administrative Officer, State Pollution Control Board, Odisha, Bhubaneswar	Member
4.	Env. Scientist, (In charge of Chemical and Biological Laboratory), State Pollution Control Board, Odisha, Bhubaneswar	Member
5.	Deputy Env. Scientist, (In charge of Air, Soil and Hazardous Laboratory), State Pollution Control Board, Odisha, Bhubaneswar	Member
6.	Accounts Officer, State Pollution Control Board, Odisha, Bhubaneswar.	Special Invitee
7.	Env. Scientist, (Purchase), State Pollution Control Board, Odisha, Bhubaneswar	Member Convenor

3.3 LIBRARY PURCHASE COMMITTEE

In pursuance of Section 9 of the Water (Prevention & Control of Pollution) Act, 1974 and Section 11 of the Air (Prevention & Control of Pollution) Act, 1981 an Internal Purchase Committee has been constituted vide office order No. 11994 dt. 23.07.2014 and amended vide office order No.2235/Estt.(Misc.) 60/2010 dt.28.02.2019 for examining and recommending purchase of Books, Journals, Reports, Non-book materials, furniture and other requisites for the Library. Members of the committee are given in Table - 3.8.

Table - 3.8 Members of the Library Purchase Committee

1.	Member Secretary, State Pollution Control Board, Odisha	Chairman
2.	Senior Environmental Engineer- L-I (N), State Pollution Control Board, Odisha	Member
3.	Senior Environmental Engineer- L-I (C), State Pollution Control Board, Odisha	Member
4.	Senior Environmental Scientist – L-I (P), State Pollution Control Board, Odisha	Member
5.	Administrative Officer, State Pollution Control Board, Odisha	Member
6.	Sr. Law Officer, State Pollution Control Board, Odisha	Member
7.	SES, In-Charge of Library upto 27.02.2019 (Order No.15332, dtd.23.11.2017) and SEE, In-Charge of Library (Order No. 2235/Estt. (Misc)60/2010 dtd. 28.02.2019)	Member Convener

CHAPTER – IV

BOARD MEETING

4.1 In the year 2018-19 two Board Meetings were held.
The 117th & 118th Board meetings of the State Pollution Control Board, Odisha were held on 5th September, 2018 & 29th January,2019 respectively.

4.2 IMPORTANT DECISIONS OF THE 117th BOARD MEETING ARE AS FOLLOWS:

i. Approval of the proposal for re-constitution of Internal Consent committee and consent committee.

ii. The Board perused the "Policy report on proposed mitigation strategies for Angul-Talcher Industrial Area" submitted by Centre for Atmospheric Sciences (CAS), Indian Institute of Technology, Delhi and also the policy brief report on Heat Island Study of the Ib Valley, Jharsuguda conducted by The Energy Reseach Institute (TERI), New Delhi.

iii. The Board approved the proposal for strengthening of cadre of Laboratory officer.

4.3 IMPORTANT DECISIONS OF THE 118th BOARD MEETING ARE AS FOLLOWS:

i. The Board approved the proposal for revision of budget for the financial year 2018-19 to Rs. 6,275.47 lakh as against the anticipated receipt of Rs. 6,980.21 lakh.

ii. The Board approved the budget estimate for the financial year 2019-20 at Rs. 5,556.00 lakh as against the anticipated receipt of Rs. 6,290.01 lakh.

iii. The Board approved the proposal for modicication of office order No.2186, dtd.31.01.2018 issued on delegation of power to the officers of the Board in the matter of grant of Consent to Establish, Consent to Operate and grant of Authorization for Bio-mecical Waste Management.

iv. The Board approved the proposal of delegation of power to Chief Environmental Engineer & Chief Environmental Scientist.

v. The Board decided to constitute a committee under the Chairmanship of the Member Secretary, SPC Board, Odisha to examine the Service Regulations of the Board and recommend for amendment of different provisions.

vi. The Board approved the classification of additional industrial units under Red/Orange/Green/ White categories.

vii. The Board ratified the constitution of the 'Technical Committee' and the 'Purchase Committee' constituted for procurement of scientific equipments/instruments/ accessories etc.

CHAPTER – V

ACTIVITIES

5.1 CONSENT TO ESTABLISH (CTE)

5.1.1 Projects related to Manufacturing and Service Sectors

Board received 1030 applications from different manufacturing and service sectors for consent to establish during 2018-19 and 492 pending proposals were carried forward from the year 2017-18.

Consent to establish was granted to 949 units. The detailed status of 1522 Consent to Establish applications processed during 2018-19 is given in Table-5.1 and 5.2.

Table - 5.1 Status of Consent to Establish (CTE)

Sl. No.	Status	Head office (H.O.)	Regional Office (R.O)	Total
1.	No. of applications received during 2018-19	124	906	**1030**
2.	No. of applications carried forward from 2017-18	54	438	**492**
	Total applications	**178**	**1344**	**1522**
	i) Consent to establish granted	82	867	**949**
	ii) Consent to establish refused	02	44	**46**
	iii) No.of applications rejected	04	00	**04**
	iv) No. of applications under evaluation	90	433	**523**

Table - 5.2 Details of Consent to Establish Status by Regional Offices

Regional Office	No. of applications received during 2018-19	No. of applications carried forward from year 2017-18	Total no. of applications received	No. of units granted	No. of units refused	No. of cases disposed off	Under evaluation
1	**2**	**3**	**4 (2+3)**	**5**	**6**	**7** (5+6)	**8** (4-7)
Angul	61	33	94	66	00	66	28
Balasore	85	01	86	83	00	83	03
Berhampur	183	61	244	138	Oo	138	106
Bhubaneswar	83	154	237	111	00	111	126
Cuttack	98	23	121	80	00	80	41
Jharsuguda	45	01	46	23	21	44	02
Kalinga Nagar	30	35	65	53	01	54	11
Keonjhar	37	03	40	30	02	32	08
Paradeep	21	07	28	20	01	21	07
Rayagada	69	68	137	53	19	72	65

Regional Office	No. of applications received during 2018-19	No. of applications carried forward from year 2017-18	Total no. of applications received	No. of units granted	No. of units refused	No. of cases disposed off	Under evaluation
Rourkela	98	11	109	94	00	94	15
Sambalpur	96	41	137	116	00	116	21
Total	906	438	1344	867	44	911	433

5.1.2 Mines and Minor Minerals

The detailed status of 154 applications processed for consent to establish mining and Minor Minerals operations during 2018-19 is given in Table-5.3.

Table - 5.3 Status of Consent to Establish Mines & Minor Minerals

Sl. No.	Status	Mines & Minor Minerals
1.	Applications received during 2018-19	105
2.	Applications carried forward from 2017-18	49
3.	**Total number of applications**	**154**
	Consent to Establish granted	110
	No. of applications under evaluation	44

5.1.3 Status of Consent to Establish of Brick Manufacturing Units

Details of consent to establish of brick manufacturing units during 2018-19 are given in Table-5.4.

Table - 5.4 Status of Consent to Establish Brick Manufacturing Units

Sl. No.	Status	Number of Cases
1.	No. of applications received during 2018-19	06
2.	No. of applications carried forward from 2017-18	15
3.	**Total number of complete applications**	**21**
4.	Consent to Establish granted	03
5.	No. of applications under evaluation	18

5.1.4 Status of Consent to Establish of Stone Crushers and Mineral Beneficiation Units

Consent to establish status of stone crushers and mineral beneficiation units and mineral stack yard during 2018-19 is given in Table-5.5.

Table - 5.5 Status of Consent to Establish Stone Crushers and Mineral Benefication Units

Sl. No.	Status	Number of Cases
1.	No. of applications received during 2018-19	100
2.	No. of applications carried forward from 2017-18	89

Sl. No.	Status	Number of Cases
3	**Total Number of complete applications**	**189**
4.	Consent to Establish granted	139
5.	No. of applications under evaluation	50

5. 2 CONSENT TO OPERATE (CTO)

5.2.1 Status of Consent to Operate

Board has received 2599 applications from industries, mines, stone crushers, iron ore crushers, brick kilns, hotels, hospitals, ceramic and refractories, telecom services, urban local bodies / townships and country liquor manufacturing units etc. and 755 pending cases were carried forward from 2017-18 and disposed 2483 applications for consent to operate during the year 2018-19. The details are given in Table-5.6.

Table - 5.6 Status of Consent to Operate

Name of the office	No. of complete applications received 2018-19	No. of cases carried forward from 2017-18	Total no. of complete applications	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evaluation	No. of Show Cause Notices Issued
1	**2**	**3**	**4 (2+3)**	**5**	**6**	**7 (5+6)**	**8 (4-7)**	**9**
Angul R.O.	302	114	416	267	00	267	149	24
Balasore R.O.	186	31	217	198	03	201	16	00
Berhampur R.O.	437	66	503	351	00	351	152	96
BBSR, R.O	265	147	412	224	00	224	188	00
Cuttack R.O.	155	43	198	155	00	155	43	06
Keonjhar R.O.	62	25	87	62	00	62	25	03
Rayagada R.O.	223	142	365	221	04	225	140	112
Rourkela R.O.	60	56	116	68	00	68	48	22
Sambalpur R.O.	446	73	519	423	16	439	80	56
Kalinga Nagar	129	03	132	121	01	122	10	26
Jharsuguda RO	83	25	108	56	50	106	02	06
Paradeep RO	42	07	49	47	00	47	02	16
Head office	209	23	232	211	05	216	16	34
Total	**2599**	**755**	**3354**	**2404**	**79**	**2483**	**871**	**401**

Category wise consent to operate status during 2018-19 is given in Table-5.7 (a),(b)&(c)

Table - 5.7 Categorywise Consent to Operate Status

(a) Mines & Minor Minerals

Name of the office	No. of complete appli-cations received	No. of cases carried forward from 2017-18	Total no. of complete appli-cations	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
1	2	3	4(2+3)	5	6	7(5+6)	8(4-7)	9
Angul R.O.	35	16	51	45	00	45	06	00
Balasore R.O.	85	00	85	85	00	85	00	00
Berhampur R.O.	60	00	60	57	00	57	03	00
Bhubaneswar R.O	01	00	01	00	00	00	01	00
Cuttack R.O.	04	09	13	13	00	13	00	00
Jharsuguda	03	00	03	03	00	03	00	00
Kalinga Nagar	35	00	35	33	00	33	02	00
Keonjhar R.O.	11	01	12	09	00	09	03	00
Paradeep RO	00	00	00	00	00	00	00	00
Rayagada R.O.	07	13	20	15	00	15	05	00
Rourkela R.O.	15	10	25	16	00	16	09	00
Sambalpur R.O.	19	10	29	27	00	27	02	00
Head office	57	00	57	47	01	48	09	05
Total	**332**	**59**	**391**	**350**	**01**	**351**	**40**	**05**

(b) Status of Consent to Operate (Stone Crusher & Mineral Beneficiation Unit)

Name of the office	No. of complete appli-cations received	No. of cases carried forward from 2017-18	Total no. Of complete applications	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)	9
Angul R.O.	169	56	225	128	00	128	97	14
Balasore R.O.	32	00	32	31	01	32	00	00
Berhampur R.O.	60	02	62	36	00	36	26	12
Bhubaneswar R.O	96	15	111	81	00	81	30	00
Cuttack R.O.	03	00	03	00	00	00	03	01
Jharsuguda	04	00	04	04	00	04	00	00
Kalinga Nagar	30	01	31	26	00	26	05	06
Keonjhar R.O.	06	00	06	05	00	05	01	02

Name of the office	No. of complete appli-cations received	No. of cases carried forward from 2017-18	Total no. Of complete applications	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
Paradeep	00	00	00	00	00	00	00	00
Rayagada R.O.	19	07	26	18	01	19	07	03
Rourkela R.O.	04	15	19	05	00	05	14	01
Sambalpur R.O.	14	30	44	30	00	30	14	08
Total	**437**	**126**	**563**	**364**	**02**	**366**	**197**	**47**

(c) Brick Manufacturing Units

Name of the office	No. of complete appli-cations received 2018-19	No. of cases carried forward from 2017-18	Total no. of complete appli-cations	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
1	**2**	**3**	**4** (2+3)	**5**	**6**	**7** (5+6)	**8** (4-7)	**9**
Angul R.O.	06	04	10	00	00	00	10	04
Balasore R.O.	00	00	00	00	00	00	00	00
Berhampur R.O.	00	00	00	00	00	00	00	00
Bhubaneswar R.O	02	01	03	03	00	03	00	00
Cuttack R.O.	00	06	06	00	00	00	06	00
Jharsuguda	00	00	00	00	00	00	00	00
Kalinga Nagar	01	00	01	01	00	01	00	06
Keonjhar R.O.	00	00	00	00	00	00	00	00
Paradeep RO	01	00	01	01	00	01	00	11
Rayagada R.O.	00	00	00	00	00	00	00	00
Rourkela R.O.	00	06	06	00	00	00	06	00
Sambalpur R.O.	00	01	01	00	00	00	01	00
Total	**10**	**18**	**28**	**05**	**00**	**05**	**23**	**21**

5.2.2 Status of Consent to Operate for Wastewater Treatment Facility by the Urban Local Bodies/ Townships under Water (Prevention & Control of Pollution) Act, 1974

The Urban Local Bodies (ULBs) and the industrial townships are required to be regulated under consent administration for disposal of sewage effluent as per provisions under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

The Board has issued directions to all Municipal authorities as per the CPCB direction dtd. 21.04.2015 to seek Consent under Water (PCP) Act,1974 and submit the detail compliance with time bound action plan for setting up sewerage system/septage management covering proper collection, treatment & disposal of sewage generated in the local / urban area. The Board intimated all the ULBs to improve sanitary conditions of open drain carrying sewage/ sullage as per the CPCB guidelines. The new standards formulated by CPCB, Delhi for treated sewage effluent has been intimated to all the ULBs and concerned departments with instruction that the treated effluent shall meet the new prescribed standard.

The Board has issued show cause notice 02 nos. of ULBs for non compliance of prescribed standards for discharge of sewage efflulent

The Hon'ble High Court has initiated leagal action against ULBs which is continuing.

5.2.3 Status of Installation of GPRS based Real Time Data Acquisition System (RT-DAS) from the Online Monitoring Stations of the Industries in Odisha

The Board has implemented online monitoring system as a tool for self-regulation for the industries and at the same time, maintain transparency with the regulators i.e, SPCBs and CPCB. The CPCB advised all the SPCBs to install central server and software for acquisition of real time data. The system has been introduced with an objective to receive online monitoring data from all the States and to maintain a central data base by CPCB for the whole country.

The State Pollution Control Board, Odisha has developed a GPRS based Real Time Data Acquisition System (RT-DAS) using 'Y' cable to receive tamper proof data directly from online Stack, AAQ & Effluent monitoring systems installed by the industries. The central RT-DAS server has been installed in the Computer Cell of State Pollution Control Board, Odisha at its Head Office, Bhubaneswar. This RT-DAS server is receiving data from 150 industries and 24 mines operating in the State. The status of RT-DAS for the online is given in Table -5.8.

Table - 5.8 Status of Real Time Data Acquisition from the Online Continuous Monitoring Stations of Industries & Mines in Odisha

INDUSTRIES

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
1	Aarti Steels Ltd, Athagarh, Cuttack, Odisha,	4	7	0
2	ACC Limited, Baragarh	3	4	0
3	Action Ispat and Power (P) Ltd, Jharsuguda	4	4	0
4	Adhunik Metaliks Ltd., Chadrihariharpur,Sundargarh	4	11	0
5	Aditya Aluminium (A Unit of Hindalco Industries Limited), Lapanga, Sambalpur	4	14	1

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
6	Aditya Kraft & Papers Pvt. Ltd., Athagarh,Cuttack	0	2	2
7	Agrasen Sponge Private Limited., Chungimati, Sundargarh	0	3	0
8	Aryan Ispat and Power Pvt Ltd., Lapanga, Sambalpur	3	2	0
9	Aska CO-OP.Sugar Industries Ltd., Aska	0	2	1
10	B.R. Sponge and Power Ltd.. Bonai, Sundargarh	0	2	0
11	Bhagawati Steels Pvt. Ltd., Jharsuguda	0	1	0
12	Bhaskar Steel and Ferro Alloy Limited, Bonaigarh, Sundargarh	0	1	0
13	Bhubaneshwar Power Pvt. Ltd., Cuttack,	4	2	0
14	Bhushan Energy Limited , Angul	1	3	0
15	Bhushan Power and Steel Limited, Rengali, Sambalpur	2	35	4
16	Bhushan Steel Limited, Meramundali, Dhenkanal	7	35	7
17	BILT Graphics Paper Products Ltd., Jaypore, Korapur	4	3	1
18	Birla Tyres, Chhanpur, Balasore	1	3	0
19	Boudh Distillery Pvt. Ltd., (Ramvikata)	0	1	1
20	Brand Steel and Power Pvt. Ltd., Keonjhar	0	1	0
21	BRG Iron and Steel Co. Pvt. Ltd.,Dhenkanal	4	3	0
22	Concast Steel and Power Ltd., Badmal, Jharsuguda,	0	7	0
23	Cosboard Industries Limited , Jagatpur, Cuttack	0	2	1
24	Cracker India Alloys Limited, Barbil,Keonjhar	0	1	0
25	Emmami Paper Mills Limited, Balasore	3	3	1
26	Essar Power (Odisha) Ltd., Paradeep, Jagatsinghpur	3	2	1
27	Essar Steel India Limited, Paradeep, Jagatsinghpur	3	1	0
28	FACOR Power Limited, Randia, Bhadrak,	2	1	0
29	Ferro Manganese Plant, Joda of Tata Steel (Joda)	0	4	0
30	Ganesh Sponge Pvt. Ltd.,Angul	0	1	0
31	GMR Kamalanga Energy Ltd., Kamalanga, Dhenkanal	4	3	1
32	Goa Carbon Limited, Paradeep, Jagatsinghpur	2	1	0
33	Govindam Projects Pvt Ltd., Kuarmunda, Sundargarh	0	1	0
34	Grasim Industries Limited, Ganjam	0	3	1
35	Green Waves Pvt Ltd., Bali, Cuttack	0	0	1
36	Grewal Associates Pvt. Ltd., Barbil, Keonjhar	0	2	0
37	HINDALCO Ltd., FRP Plant, Hirakud, Sambalpur	0	3	2
38	HINDALCO Ltd.,CPP, Hirakud, Sambalpur	3	5	1
39	HINDALCO Ltd.,Smelter Plant, Hirakud, Sambalpur	1	7	5
40	Hindustan CocaCola Beverages Pvt. ltd., Khurda	0	0	1

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
41	Indian Farmers Fertilizer Co-operative Ltd., Paradeep, Jagatsinghpur	3	8	1
42	Indian Metal and Ferro Alloys Ltd (120 MW Power Plant), Choudwar, Cuttack	0	2	0
43	Indian Metal and Ferro Alloys Ltd (Charge Chrome Plant, Choudwar, Cuttack	0	3	0
44	Indian Metal and Ferro Alloys Ltd., Choudwar, Cuttack	4	6	0
45	Indian Oil Corpation Limited, Paradeep, Jagatsinghpur	7	22	1
46	Jai Balaji Jyoti Steels Limited, Tainser, Sundargarh	0	2	0
47	Jai Hanuman Udyog Ltd., Kolabira, Jharsuguda	0	1	0
48	Jalan Carbon and Chemicals Pvt. Ltd., Talcher, Angul	1	0	0
49	Jay Iron & Steels Ltd., Rourkela, Sundargarh	0	1	0
50	Jay Jagannath Steel and Power Limited Sambalpur	0	2	0
51	Jindal India Thermal Power Ltd., Talcher, Angul	4	2	1
52	Jindal Stainless Ltd.,Jajpur	4	7	2
53	Jindal Steel and Power Limited, Angul	6	38	3
54	Jindal Steel and Power Ltd., Barbil, Keonjhar	2	2	0
55	JK Paper Ltd.,Jaykaypur, Rayagada	3	3	0
56	K. J. Ispat Limited, Duburi, Jajpur	0	1	0
57	Kalinga Calciner Limited (Udayabata)	0	2	0
58	Kalinga Sponge Iron Ltd., (Kalunga)	0	1	0
59	Kamal Jeet Singh Ahluwalia, Keonjhar	0	3	0
60	Kapilas Cement Manufacturing Works (A unit of OCL India Ltd., Tangi, Cuttack	3	1	0
61	Kasvi International, formerly known as Patnaik Mineral	0	2	0
62	Kaushal Ferrometals Pvt. Ltd., Sundargarh	0	1	0
63	Khedaria Ispat Ltd., Nikenbahal, Sundrgarh	0	1	0
64	L N Metallics Ltd.,Sripura, Jharsuguda	0	1	0
65	Ores Ispat Pvt. Limited, (Bonaigarh)	0	1	0
66	Maa Manasha Devi Alloys Pvt. Ltd., (Lahunipada)	0	1	0
67	Maa Samleswri Industries (P) Ltd., (Rengali)	0	1	0
68	Maa Shakumbari Sponge Pvt. Ltd., Rourkela, Sundargarh	0	1	0
69	Mahakali Ispat Pvt. Ltd., Bonaigarh, Sundargarh	0	1	0
70	Maithan Ispat Limited, Jakhapura, Jajpur	0	2	0
71	Mayur Electro Ceramics Pvt. Ltd., Baripada, Mayurbhanj	0	2	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
72	Meta Sponge Pvt. Ltd., Sundargarh	0	1	0
73	MGM Minerals Limited (Steel Division), Nimidha, Dhenkanal	0	1	0
74	Mideast Integrated Steels Ltd., Jajpur	5	3	0
75	MSP Metalics Limited, Jharsuguda	1	8	0
76	MSP Sponge Iron Limited, Keonjhar	0	3	1
77	N. K. Bhojani Pvt. Ltd., Keonjhar	0	1	0
78	NALCO Ltd.,Captive Power Plant, Angul	4	10	1
79	NALCO Ltd.,Refinery, Damanjodi, Koraput	4	9	1
80	NALCO Ltd.,Smelter Plant, Angul	4	11	1
81	Narbheram Power and Steel Pvt. Ltd., Dhenkanal	0	1	0
82	Nava Bharat Ventures Ltd., Dhenkanal	3	3	1
83	Neelachal Ispat Nigam Limited, Duburi, Jajpur	3	4	2
84	New Laxmi Steel and Power Pvt. Ltd., Khordha	0	2	0
85	NTPC Limited (TSTPS), Deepshikha, Angul	4	6	1
86	NTPC Limited (TTPS) Talcher Thermal, Angul	4	6	1
87	NTPC-SAIL Power Company Private Limited, Rourkela, Sundargarh,	4	2	0
88	OCL India Ltd,Cement Unit, Rajgangpur, Sundargarh	4	10	1
89	OCL Iron and Steel Limited, Rajgangpur, Sundargarh	0	4	0
90	Odisha Power Generation Corporation Ltd., Banaharpali, Jharsuguda	4	2	1
91	Paradeep Phosphate Ltd., Paradeep, Jagatsinghpur	4	9	3
92	Patnaik Steels and Alloys Ltd., Keonjhar	0	1	0
93	Pawanjay Sponge Iron Limited, Bijabahal, Sundargarh	0	1	0
94	Pooja Sponge Pvt. Ltd., Kalunga, Sundargarh	0	2	0
95	Prabhu Sponge(p) Limited, Rajgangpur, Sundargarh	0	2	0
96	R. B. Sponge Pvt. Ltd., Jayantpur, Sambalpur	0	1	0
97	Reliable Sponge Pvt. Ltd. (Bonai Unit), Bonaigarh, Sundargarh	0	1	0
98	Reliable Sponge Pvt. Ltd.,(KALUNGA), Sundergarh	0	3	0
99	Rexon Strips Ltd., Rourkela, Sundargarh	0	1	0
100	Rourkela Sponge LLP (Kalunga)	0	2	0
101	Rourkela Steel Plant, Rourkela, Sundargah	4	20	8
102	Rungta Mines Limited, Koira, Sundargarh	4	5	0
103	Rungta Mines Ltd., Karakola (Barbil)	0	2	0
104	Sakthi Sugars Limited (Distillery), Haripur, Dhenkanal	0	1	2

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
105	Sakthi Sugars Limited, Haripur, Dhenkanal	0	1	3
106	Samaleswari Ferro Metals Ltd., Bishalkhinda, Sambalpur,	0	1	0
107	Sani Clean Pvt. Ltd., Khordha	0	1	0
108	Scan Steels Limited (Unit-2), Budhakata, Sundargarh	0	3	0
109	Scan Steels Limited (Unit-I), Rajgangpur, Sundargarh	0	1	0
110	Seeta Integrated Steel and Energy Ltd., Sundargarh	0	2	0
111	Seven Star Steels Ltd., Jharsuguda	0	2	0
112	Shiv Mettalicks (P) Ltd., Rourkela, Sundargarh, Odisha	0	2	0
113	Shiva Cement Ltd., Rourkela, Sundargarh	0	4	0
114	Shree Ganesh Metalics(Kuarmunda), Rourkela, Sundargarh	0	3	0
115	Shree Hari Sponge Pvt. Ltd., Bonaigarh, Sundargarh,	0	1	0
116	Shri Hardev Steels Pvt. Ltd., Athagarh, Cuttack	0	3	0
117	Shri Jagannath Steels and Power Ltd., Barbil, Keonjhar	0	3	0
118	Shri Mahavir Ferro Alloys Pvt. Ltd., Rourkela, Sundargarh	0	4	0
119	Shyam Metalics and Energy Ltd., Lapanga, Sambalpur	4	9	1
120	SMC Power Generation Limited, Hirma, Jharsuguda	4	2	0
121	Sponge Udyog Pvt. Ltd., Kalunga, Sundargarh	0	1	0
122	Sree Metaliks Ltd., Rugudihi, Keonjhar	0	5	0
123	Sri Balaji Metallics Pvt. Ltd., Birkela, Sundargarh	0	1	0
124	Sumrit Metaliks Pvt. Ltd., Barbil, Keonjhar	0	1	0
125	Suraj Products Pvt. Ltd., Rajgangpur, Sundargarh	0	3	0
126	Surendra Mining Industries (P) Ltd., Bonai, Sundargarh	0	2	0
127	Swastik Ispat Pvt. Ltd., Kuarmunda, Sundargarh	0	4	0
128	Tata Sponge Iron Ltd., Joda, Keonjhar	3	3	0
129	TATA STEEL Kalinganagar, Keonjhar	4	18	3
130	TATA Steel Limited (Joda)	0	1	0
131	Thakur Prasad Sao and Sons Pvt. Ltd., Lahandabud, Jharsuguda	0	2	0
132	The Bargarh Co-operative Sugar Mills Ltd., Bargarh	0	1	0
133	Times Steel and Power Pvt. Ltd., Rourkela, Sundargarh	0	1	0
134	Toshali Cement Private Limited, Ampavalli, Koraput	0	3	0
135	T R Chemicals Ltd., Rajgangpur, , Sundargarh	0	1	0
136	TRL Krosaki Refactories Ltd., Belpahar, Jharsuguda	2	4	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2019		
		AAQMS	CEMS	EQMS
137	UltraTech Cement Ltd., Arda, , Jharsuguda	4	2	0
138	Utkal Alumina International Ltd., Doraguda, Rayagada	4	5	1
139	Utkal Metallics Limited, Rourkela, Sundargarh	0	1	0
140	Vasundhara Metaliks Pvt Ltd., Sundargarh	0	1	0
141	Vedanta Limited (Smelter & CPP) Bhurkamunda	4	29	3
142	Vedanta Ltd., (IPP) Jharsuguda	4.	4	1
143	Vedanta Ltd., Lanjigarh, Kalahandi	2	3	0
144	Vikram Pvt. Ltd., Bonai, Sundargarh	0	1	0
145	Viraj Steel and Energy Ltd., Lapanga, Sambalpur	0	2	0
146	Viraja Steel & Power Private Limited, Athgarh, Cuttack	0	2	0
147	Visa Steel Limited, Kalinganagar, Jajpur	4	5	1
148	VISA SunCoke Limited, Kalinganagar, Jajpur	0	2	0
149	Vishal Metallics Pvt Ltd., Bonai, Sundargarh	0	1	0
150	Yazdani Steel and Power Limited, Kalinga Nagar, Jajpur	0	2	0
	Total	**191**	**496**	**67**

MINES

Sl. No.	Name of the Mine	CAAQMS	CEMS	EQMS
1	Barsuan-Taldih-Kalta Iron Ore Mines of SAIL, Sundargarh	3	0	0
2	Balda Block Iron Mines of Serajuddin & Co, Keonjhar	4	0	0
3	Bolani Iron Ore Mines of SAIL, Keonjhar	4	0	0
4	Jajang Iron and Manganese Mines of Rungta Mines Ltd., Keonjhar	4	0	0
5	Joda East Iron Mines of Tata Steel Ltd, Keonjhar	3	0	0
6	Kamarda Chromite Mines of B. C. Mohanty & Sons Pvt. Ltd., Jajpur	0	0	2
7	Kalarangiatta Chromite Mines of FACOR Ltd., Jajpur	0	0	2
8	Kaliapani Chromite Mines of Balasore Alloys Ltd., Jajpur	0	0	2
9	Katamati Iron Ore Mines of TATA Steel Ltd., Keonjhar	3	0	0
10	Koira Iron Ore Mine of M/s. Essel Mining Industries Ltd, Sundargarh	3	0	0
11	Nadidih Iron and Manganese Ore Mines of Bonai Industrial Co. Ltd., Sundargarh	3	0	0
12	Nadidih Iron and Manganese Ore Mines of Feegrade & Co. Pvt. Ltd., Sundargarh	4	0	0

Sl. No.	Name of the Mine	CAAQMS	CEMS	EQMS
13	Nuagaon Iron Ore Mines of KJS Alhuwalia, Keonjhar	3	0	0
14	Oraghat Iron Ore Mines of Rungta Sons (P) Ltd., Sundargarh	3	0	0
15	Ostapal Chromite Mines of FACOR, Jajpur	0	0	2
16	Saruabil Chromite Mines of Mishrilal Mines (P) Ltd., Jajpur	0	0	2
17	Serenda Bhadrasahi Iron & Manganese Mine of M/s. OMC Ltd, , Keonjhar	1	0	0
18	South Kaliapani Chromite Mines of OMC Ltd., Jajpur	0	0	5
19	Sukinda Chromite Mines	0	0	3
20	Mahagiri Chromite Mines of M/s IMFA, Jajpur	0	0	2
	Sukinda Chromite Mines of TATA Steel Ltd, Jajpur	0	0	3
21	Tailangi Chromite Mines of IDCOL, Jajpur	0	0	2
22	Thakurani Iron Ore Mines of Kaypee Enterprises, Keonjhar	4	0	0
23	Jillinga Mines of Essel Mining Corporation, Keonjhar	3	0	0
24	Kahandbondh Iron ore mines of Tata Steel , Keonjhar	3	0	0
	Total	**48**	**0**	**25**

5.3 CLOSURE DIRECTIONS

As a part of the Board's regulatory role, all units brought under consent administration, if found defaulting the prescribed standards, are allowed reasonable time to comply with the standards. On persistent non-compliance, the defaulting units are served with Show Cause Notices (Table 5.6) followed by personal hearing and are generally prescribed time bound action plan for compliance. Consistent non-compliances lead to issue of closure directions. Table-5.9 shows the status of closure directions, issued by the Board.

Table - 5.9 Status of Closure Directions Issued during 2018-19.

No. of directions issued	No of industries under closure	No. of revocations after due compliance
200	**143**	**57**

5.4 PUBLIC HEARING

The State Pollution Control Board has been entrusted with the responsibility of conducting public hearing for the projects requiring environmental clearance from the Ministry of Environment and Forests with the assistance from the District Administration as per EIA Notification No. S.O.-1533 (E), dt. 14.09.2006.

Details of public hearings conducted during the period 2018-19 are given in Table-5.10 and 5.11.

Table - 5.10 Status of Public Hearings

1	Number of projects received by the Board for public hearing during the financial year 2018-19.	42
2	Number of projects carried forward from previous financial year 2017-18	10
3	**Total Number of projects received for public hearing**	**52**
4	Number of projects for which public hearing have been conducted	45
5	Number of cases wherein Collectors were requested to fix up date	07

Table - 5.11 Details of Projects for which Public Hearings Conducted

Sl No.	Name & Address of the project	Purpose	Date	Category
1	Dhamraport Company Ltd, Bhadrak.	Revised master plan for Development of Dhamra port	11.4.2018	A
2	Khairbandha Barrage Project, Mayurbhanj.	Construction of Barrage across Khairibandha river	13.4.2018	B
3	Damadara rope way & infra Ltd, Nandankanan Zoological park,BBSR ,Khordha.	Pulsated Monocable System Passenger Ropeway	18.5.2018	A
4	Bhaskar Steel & Ferro alloys Pvt. Ltd, Badatumkela ,Sundargarh.	Modification cum Expansion of existing steel plant capacity from 0.1 MTPA billet to 0.26 MTPA billet out of which 0.132 MTPA to be converted to TMT rods	25.5.2018	A
5	Bharat Petroleum Corporation Ltd. Baulsingha,Bhatli, Bargarh.	Establishment of 100 KLPD Lignocellulosic 2G Ethanol Plant	27.6.2018	B
6	Indian Oil Corporation Ltd,Somnathpur, Khordha.	Construction of LPG Bulk Storage (1800MT) and Bottling Facility (Indane Bottling Plant)	20.7.2018	B
7	Paradeep Port Trust, Paradeep,Jagatsinghpur	Development of Outer Harbour, Inner Harbour including Western Dock and Mechanization of existing operational berths	29.09.2018	A
8	Paradeep Municipality,Paradeep, Jagatsinghpur	Municipal Solid Waste Management (Landfill) Project	11.09.2018	B
9	Lanjiberna Lime stone Mines, M/s OCL Rajgangpur,Sundargarh.	Expansion of production capacity from 4.2 MTPA Limestone and 0.08 MTPA Dolomite to 9.5 MTPA Limestone and 0.08 MTPA Dolomite (17.0 MTPA ROM) over an area of 873.057 Ha	03.10.2018	A
10	Nadidih Iron and Manganese Mines of M/s Bonai Industrial Company Ltd. at villages Nadikasira & Rengalbeda, Koira, Dist-Sundargarh.	Expansion of production of iron ore from 5.3 MTPA to 9.0 MTPA,M.L-73.855 ha.	10.10.2018	A
11	Badampahar Iron Ore Mines of M/s. Lal Trade & Agencies Pvt.Ltd, Dhangrimuta,Budhijharan and Badampahar RF, Dist- Mayurbhanj	Enhancement in Iron ore production from 0.72 MTPA to 1.5 MTPA over an area of 129.61 ha	10.10.2018	A

Sl No.	Name & Address of the project	Purpose	Date	Category
12	Narayanposi Iron and Manganese Ore Mines M/s Aryan Mining &Trading Corporation Pvt Ltd, At- Koira&Kashira and Kathamala R.F,Dist- Sundargarh.	Expansion of iron ore from 3.0 MTPA to 6.0 MTPA, existing Mn-0.036 MTPA, Beneficiatio plant-2.0 MTPA, M.L-349.254 Ha.	15.10.2018	A
13	Nadidih Iron and Manganese Mines of M/s Feegrade& Co. (P) Ltd. at villages Nadikasira & Rengalbeda, Tehsil Koira in Sundargarh district	Enhancement in production capacity of ROM Iron ore 6.0 MTPA and reduction in dry processing (crushing and screening) of low grade iron ore (Total handling 7.451 MTPA) over an area of 121.405 Ha.	25.10. 2018	A
14	M/s. Jajpur Cements Pvt. Ltd, at Kalinganagar Industrial Complex, Dist- Jajpur.	Establishment of 1.5 MTPA capacity Cement Grinding unit	26.10. 2018	B
15	Oraghat Iron Ore Mines of M/s. Rungta Sons Pvt. Ltd, at Orghat and Sanindpur, Sundargarh	Enhancement of production capacity of Iron Ore from 5.0 MTPA 8.35 MTPA (7.35 MTPA iron ore (ROM) over an area of 82.961 Ha	26.10. 2018	B
16	M/s. Essel Mining & Industries Ltd, Koira Iron Ore Mines, Koira, Kadodihi & Harischandrapur, Sundargarh	Enhancement of iron ore production from 4.0 MTPA to 6.0 MTPA over an area of 90.143 Ha	30.10. 2018	B
17	Sukrangi Chromite mines,M/s OMC Ltd, Jajpur	Enhancement in chromite ore production from 1.3 LTPA to 3.0 LTPA over an area of 382.709 Ha	09.11. 2018	A
18	Roida - II Iron Mines of M/s. KhatauNarbheram & Co. at - Roida and Tanto villages, Barbil tehsil ,Dist- Keonjhar	Expansion in iron ore production from Production of 2.2 MTPA to 3.5 MTPA over an area of 74.867 ha	9.11. 2018	B
19	M/s. Balasore *A*lloys Ltd. at Nizigarh, Tahasil- Sukinda, Dist- Jajpur	Ferro alloys plant along with a zigging plant (20TPH),Briquetting plant(35TPH) and installation of COB(1,98,000TPA)	9-11-2018	A
20	M/s. Bharat Petroleum Corporation Ltd At- Sadashivpur,Meramandali, Dist-Dhenkanal	Construction of Common User Facility (CUF)for storage of around 54742 KL of petroleum products	14.11. 2018	B
21	M/s Jindal United Steel Ltd, Kalinganagar Industrial Complex, Dangadi, Dist- Jajpur	Expansion of Hot strip mill capacity from 1.6 MTPA to 3.2 MTPA and installing 0.3 MTPA CRM	14.11. 2018	A
22	M/s Jindal Stainless Ltd ,at Dangadi, Dist- Jajpur	Expansion of Crude Stainless Steel Production from 0.8 MTPA to 2.2 MTPA and Cold Rolling Mill(CRM) from 0.8 MTPA to 1.6 MTPA	14.11. 2018	A
23	M/s Sanjukta Gems, Pipalpadar Gem Stone Deposit, Pipalpadar&Sirjapalli, Kesinga,Kalahandi	Production of Cat's Eye over an area of 17.122 Ha	20.11. 2018	B

Sl No.	Name & Address of the project	Purpose	Date	Category
24	M/s. Kapilash Cement Manufacturing Works (A unit of OCL India Ltd. village- Biswali, Po-Barunia,(Cuttack)	Expansion of Cement Grinding Unit from 1.70 MTPA to 4.20 MTPA by installation of a new Cement Mill of capacity 2.5 MTPA	27.11. 2018	B
25	M/s. Kapilash Cement Manufacturing Works (A unit of OCL India Ltd. village- Biswali, Po-Barunia,(Jajpur)	Expansion of Cement Grinding Unit from 1.70 MTPA to 4.20 MTPA by installation of a new Cement Mill of capacity 2.5 MTPA	28.11. 2018	B
26	M/s Hindustan Petroleum Corporation located at- Pitamahal, tahasil Seskhal, Dist-Rayagada .	To set up LPG Bottling Plant of storage capacity 3x300 MT	28.11. 2018	B
27	M/s Starlight Pvt Ltd, GoudSargiguda,Taluka-Junagarh, Dist- Kalahandi	Establish of Grain based distillery 2x45KLD and Co-generation Power plant 1x3.0 MW along with 2x800 cases /Day of IMFL/ IMIL bottling unit at village GoudSariguda,Taluka-Junagarh	1.11. 2018	A
28	Odisha Waste Management Project (Division of RamkyEnviro EngineersLtd.),Sukinda At-Kanchichuan, Sukinda Dist-Jajpur	Common Biomedical Waste Treatment Facility by Odisha Waste Management Project	6.11. 2018	B
29	Gorumahisani iron minesM/s. GhanashyamMisra& Sons Pvt. Ltd at Kuliesilla, , Nodhabani and Gorumahisani, Mayurbhanj	Enhancement of Iron Ore production from 0.75 MTPA to 1.1 MTPA over an area of 349.50 ha.	02.11. 2018	A
30	Samalewari OCP (Phase - IV), M/s. MCL IB Valley Aea, Brajrajnagar	Expansion of Coal production (Phase -IV) of 15 MTPA with increase in ML area from 928.264 Ha. to1334.912 Ha.	14.12. 2018	B
31	Mediaid Marketing Services Amsranga, Sundargarh	Proposed Common Bio Medical Waste Treatment Facility	26.12. 2018	A
32	Sanindpur iron & Bauxite Mines, M/s Rungta Sons pvt ltd, Sanindpur & Oraghat village, Koira, Sundargarh	Expansion In Production from 4.5 MTPA to 8.06 MTPA over an area of 147.10 Ha.	28.12. 2018	A
33	Anjira Stone Quarry BSQ No.1 of Sri Tapan Kumar Nayak, Dharmasal, Dist- Jajpur	Production of 29200 cum black stone over an area of 18.41 Ha. (Cluster area of 36.82 Ha.)	29.12. 2018	B
34	Western Integrated Waste management Facility , Banjori, Deogarh	Common Hazardous waste treatment ,storage and disposal facility	24.1.2019	B
35	Siarmal OCP M/s. MCL, Basudhara Area, IB Valley Coalfields, Sundargarh	Production of 50.0MTPA coal over an area of 2580.45 Ha(project area),M.L.area-2290.45 Ha.	3.1.2019	A
36	Basundhara (W) OCP M/s. MCL , IB Valley Coalfield Basundhara Area, At/Po- Balinga, Sundargarh	Extension of OCP for production of 8.75 MTPA coal over lease area of 323.92 ha.	14.02.2019	A
37	Patabeda Iron Ore Mines M/s. MGM Minerals Ltd, Patabeda, KoiraTahsil, Sundargarh	Expansion of iron ore production from 0.8 MTPA to 1.5 MTPA (ROM) along with Crusher and Screening Plants over lease area of 28.397 Ha.	05.02.2019	B

Sl No.	Name & Address of the project	Purpose	Date	Category
38	Jagannath Colliery M.s. MCL At- Jagannath Area, Angul	Expansion of coal production from 6.0 MTPA to 7.5 MTPA with increase in mine lease area from 430.736 ha. to 553.946 ha	19.02.2019	A
39	Chilika Distilleries, Kanaka, Dist- Ganjam	Proposed 110 KLPD Grain based Distillery and 5 MW Co-generation Power Plant	23.2.2019	A
40	Mediaid Marketing Services, Arakhapada, Sergada,Dist-Ganjam	Development of Common Biomedical Waste Treatment and disposal facility at Arakhapada	26.2.2019	B
41	M/s Ardent Steel Limited, village Phuljhar, Block Bansapal, Dist- Keonjhar.	Expansion of Iron Ore Pelletisation Plant (0.6 MTPA to 1.8 MTPA), Iron ore Benefication Plant (3.0 MTPA), DRI Plant (0.6 MTPA), Pig Iron BF (0.6 MTPA), Sinter Plant (0.8 MTPA), SMS (1.2 MTPA), Rolling Mills (1.2 MTPA) and CaptivePower Plant (125 MW)	28.2.2019	A
42	Chettinad Cement Corporation Pvt Ltd, Kalinganagar I/C,Jakhapura,Jajpur.	Proposed cement grinding unit of 2x1.0MTPA	06.03.2019	B
43	Nuagaon Iron ore Mines of M/s Kamaljeet Singh Ahluwalia, in Nuagaon, Guali, Topadihi, Barapada and Katasahi villages BarbilTahsil, Dist- Keonjhar.	Expansion of Iron ore production from 5.62 MTPA to 7.99 MTPA (ROM) along with existing 2.00 MTPA Beneficiation Plant and Crushing and Screening Plants over lease area of 767.284 ha	08.03.2019	A
44	Dhenkanal Steel Plant M/s. Rungta Mines Ltd Jharbandh ,Galpada and Tarkabeda villages, Dist- Dhenkanal	Steel plant capacity 2.85 MTPA	07.03.2019	A
45	Thakurani Iron Ore Mines of M/s Kaypee Enterprises, Thakurani village Barbil Tahsil, Dist- Keonjhar.	Expansion of Iron ore production from 5.5 MTPA to 7.99 MTPA (ROM) along with Crushing and Screening Plants over lease area of 228.04 ha	09.03.2019	A

5.5 STATUS OF WATER CESS

Status of Water Cess Assessment, Collection, Remittance and Reimbursement for the Year 2018-19 is given in Table-5.12.

Table - 5.12 Status of Water Cess

Sl.No	Water Cess Assessment	Amount in Rupees ( )
1	Total Assessment of Industry	2,54,57,970
2	Arrear water cess Received	26,85,734.00
3	Remittance to MoEF (20% only)	5,37,147.00
4	Retained by the Board	21,48,587.00

The Water Cess Act,1977 has been abolished with effect from 01.07.2017. The above water cess details pertain to arrears when the Act was in force.

5.6 ENFORCEMENT UNDER THE ENVIRONMENT (P) ACT, 1986

5.6.1 Implementation of the Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016.

Ministry of Environment, Forest and Climate Change, Govt. of India in supersession of Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008 has notified the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 on 4th April, 2016. These rules apply to the management of hazardous and other waste as specified in the Schedules to these rules.

5.6.1.1. Authorisation

The Authorization status of hazardous waste generating industries during 2018-19 is given in Table 5.13.

Table 5.13 Authorization Status of Hazardous Waste

Sl. No.	Authorization status	Number
1	**Total no. of applications received**	139
2	No. of units granted authorisation	113
3	No. of units refused	01
4	**Total No. of applications disposed**	114
5	**No. of applications under evaluation**	25

5.6.1.2 Utilization and Disposal of Hazardous Waste

Utilisation of Aluminium Dross Rejects / Residues:

Aluminium Dross is a Hazardous Waste generated from the Aluminium Smelters. Although, a good numbers of actual users have been established and operating for reprocessing of the Aluminium Dross, there is no reprocessing unit in Odisha for utilisation of dross rejects / residue generated from Aluminium Dross reprocessing activities. As such rejects / residues constitute about 80% of dross, its disposal in Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) becomes very uneconomical. In the meantime, an entrepreneur, M/s A. K. Enterprises, Plot No. 45, Mouza - Brahmapur, Dist - Khordha has developed a technology in consultation with M/s Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, a CSIR laboratory for production of non-Ferric Alum by utilisation of Aluminium Dross rejects/residues. The unit has already been established with Consent of the Board. Trial permission has been accorded by CPCB and trial run has been witnessed by officials of Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB), Odisha in the presence of the Scientist of the IMMT and the report has been sent to CPCB for consideration.

(A) Authorisation Status of Actual Users of Hazardous Wastes :

During the period 2018-19, 26 Nos. of Actual Users (inside Odisha) and 25 Nos. of Actual Users (Outside Odisha) have been authorised by the Board for recycling / reprocessing of different hazardous wastes (Used Oil, Waste Oil, Used Anode Butt, Aluminium Dross, Spent Pot Lining, Used Lead Acid Battery, Zinc Skimming / Zinc Ash / Zinc Dross, Flue Gas Dust / Gas Cleaning Plant (GCP) Sludge, Vanadium Sludge, etc.) under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

List of Actual users (Processor / Recyclers) having valid authorization of SPCB (Inside Odisha)

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
1	Hindalco Industries Ltd., Smelter Unit, (In-house Dross Recycling Plant) At/Po- Hirakud, Dist - Sambalpur, Odisha – 768016 E-mail : ak.agarwala@adityabirla.com hirakud.e@adityabirla.com jagannath.p.nayak@adityabirla.com Mobile : 9090060015	Aluminium Dross - 4,000 T/A	31.03.2023
2	Aditya Aluminium Limited, (A Unit of Hindalco Industries Limited), (In-house Dross Recycling Plant) At/Po - Lapanga, Beside SH - 10, Dist – Sambalpur, Odisha – 768212 E-mail : ranjan.j@adityabirla.com Mobile : 8018043156	Aluminium Dross – 3,060 T/A & Used Anode Butt	31.03.2023
3	National Aluminium Company Ltd., Smelter Plant, NALCO Nagar, Dist-Angul-759145 E-mail : abhijit.sinha@nalcoindia.co.in Mobile : 9437155606	Used Anode Butt	31.03.2021
4	Vedanta Limited, (Smelter and CPP) At - Bhurkamunda, PO - Siripura, Dist - Jharsuguda, Odisha – 768202 E-mail : ASP.Mishra@vedanta.co.in Mobile : 9937285045	Used Anode Butt	31.03.2020
5	A. K. Enterprises Plot No. - A/29, Sarua Industrial Area, Khurda, Odisha - 752057 E-mail : enterprisesake@yahoo.co.in Mobile : 9437199846 / 9238444846	Aluminium Dross – 1,125 T/M	31.03.2020
6	A. K. Enterprises, Plot No. 45, Mouza - Brahmapur, Dist - Khordha, Odisha E-mail : enterprisesake@yahoo.co.in Mobile : 9437199846 / 9238444846	Aluminium Dross Rejects to manufacture Alum	Trial Run Conducted
7	Murugappa Enterprises At - Beherapat, Po - H. Kantapali, Dist - Jharsuguda, Odisha E-mail : khanmoinuddin927@gmail.com Mobile : 9824711777	Aluminium Dross – 750 T/M	31-03-2020
8	Shri Sai Metallik At – Jamunalia, PO - Badaposhi VIA – Naranpur, Dist - Keonjhar, Odisha E-mail : shrisaimetalik@gmail.com Mobile : 977601244	Aluminium Dross – 640 T/M	30-09-2019
9	Shree Shyam Minerals, At/Po - Hirma, Dist – Jharsuguda, Odisha E-mail : lalitpoddar@gmail.com Mobile : 9437559511	Aluminium Dross – 1500 T/M	31-03-2020

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
10	Metacast International, At/Po - Katapali, Dist - Sambalpur, Odisha E-mail : mci1990@hotmail.com Mobile : 9437052973	Used Anode Butt - 28 T/Day	27-07-2019
11	Omm Cee Business, At- IDCO Plot No. 3, Sanabramanitarang, Industrial Estate, Kalunga, Dist - Sundargarh, Odisha E-mail : ocb.rkl@gmail.com Phone : 0661-2505135	Used Anode Butt - 275 T/A	31-03-2020
12	Green Energy Resources, At - Shanti Nagar Road, Near Furniture Point, Budharaja, Dist - Sambalpur, Odisha – 768004 E-mail : gerodisha@gmail.com Mobile : 9437045555	Spent Pot Lining (Carbon Portion) - 43,200 T/A	31-03-2023
13	ECO Resource Solutions At - Kuradhamalla, Dalaiput, Dist - Khurda, Odisha E-mail : swayamprakashj@gmail.com Mobile : 9178764604	Decontamination of Empty Barrels / Containers / Liners used for handling of hazardous wastes/chemicals as per SOPs of CPCB – 700Nos./Day	31.03.2022
14	Suraj Products Ltd., At - Barapali, Post - Kesharmal, Rajgangpur, Dist - Sundargarh, Odisha E-mail : suproduct@gmail.com Mobile : 9437049074	Flue Gas Dust / Gas Cleaning Plant (GCP) Sludge of LD Furnace / Electric Arc Furnace (EAF) / Blast Furnace of Steel Plant / Captive Blast Furnace - 68,500 T/A GCP Sludge of Ferro Alloy Plant - 2,400 T/A	31.03.2024
15	Asian Petro Chemicals, At- Asanabahali, Po.-Barada, Gundichapada, Dist-Dhenk Mobile : 9040181849	Used Oil - 960 KL/A	31.03.2021
16	Chemical & Metallurgical Co., Shed No. S/III-24, Industrial Estate, Kalunga, Rourkela E-mail : chemical_042@yahoo.com	Used Oil - 720 KL/A	31.03.2021
17	Jay Maa Durga Industries, Plot No.- A/6, Industrial Estate , Kalunga-770031, Dist- Sundargarh E-mail : felixkumar007@yahoo.com Mobile : 9439231461	Used Oil - 80 T/A	31.03.2023
18	N. S. Chemicals, Plot No.-E/72, Chhend Colony, Rourkela, Sundargarh E-mail : nschemical_2902@yahoo.in Mobile : 9437220798	Used Oil - 936 KL/A	31.03.2020
19	Ratna Industries, At- Jamunanki, Po - Kuarmunda, Dist - Sundargarh -770039 E-mail : ratnaindustries.rkl@gmail.com Mobile : 9437047775	Used Oil - 750 KL/A	31.03.2020

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
20	Raj Lubricants, At/P.O - Januganj, Dist - Balasore, Odisha E-mail : rajlubricants2012@gmail.com Mobile : 9437054893	Used Oil - 1,500 KL/A	31.03.2020
21	Shree Durga Petrochemicals, Plot No. 89A, New Industrial Estate, Phase-II, Jagatpur, Dist - Cuttack, Odisha - 754021 E-mail : sdpetrochem.103@gmail.com Mobile : 9437021103	Used oil - 2,160 KL/A	31.03.2022
22	Purbanchal Petroleum Private Limited, At - Kalagada, Po - Jadupur, Dist - Kendrapara, Odisha – 754213 E-mail : purbanchalpetroleum@yahoo.in Mobile : 9439002563	Used Oil - 3,650KL/A & Waste Oil - 12,045 KL/A	31-03-2021
23	Swaraj Lubricants, At - Gobinda, Po - Haldipada, Dist - Balasore, Odisha E-mail : swarajlubricants@gmail.com Mobile : 9777076006	Used Oil - 1,500 KL/A & Waste Oil - 6,000 KL/A	31.03.2023
24	N. C. Oil Refinery Pvt. Ltd., Vill- Sova, Po - Osakana, Balikuda, Dist - Jagatsinghpur, Odisha E-mail : ncoil2010@gmail.com Mobile : 7978386334	Waste Oil - 5,000 KL/A	31.03.2023
25	Omm Sai Refinery, 58/263, Kochilagadia, Po. - Darpanigarh, Dist - Jajpur, Odisha E-mail : prafulla_raj@yahoo.com Mobile : 9437108545	Waste Oil - 10,400 KL/A	31-03-2021
26	Shriya Metals & Chemicals, At - Khairbandh, PO - Ranto Birkera, PS-Bramhanitarang, Dist - Sundargarh, Odisha – 770037 E-mail : shriya.engineersandchemicals001@gmail.com Mobile : 9438245981	Waste Oil - 7,350 KL/A	31.03.2023

List of Actual users (Processor / Recyclers) having valid authorization of SPCB (Outside Odisha)

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
1	Ashirwad Enterprise, Plot No. 17, Jalaram Industrial Estate, B/H RUDA Trans port, Sonkhada, NavagamTa & Di : Rajkot - 360003 E-mail : dmjethava@gmail.com Mobile : 9998953184	Aluminium Dross – 500 T/M	31-03-2020
2	Shivam Metallurgicals Pvt. Ltd., At - 16/1, CSIDC Phase - 2, Siltara Raipur, Chhattisgarh E-mail : shivammetal123@gmail.com Mobile : 8435011000	Aluminium Dross 1,000 T/M	31.07.2019

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
3	Green Living, Sy. No. 24/3, D-2 of Chimalapalli (V), Porlupalem Gram Panchayat, Visakhapatnam, Dist. (Andhra Pradesh) E-mail : greenliving.vizag@gmail.com Mobile : 8142323683	Spent Anode Butt – 15 T/Day	31.03.2021
4	Arth Metallurgicals Pvt. Ltd., At-215, Ambuja City Centre, Vidhan Sabha Road, Saddu, Raipur, Chhattisgarh E-mail : arthmetals@gmail.com Mobile : 7771034441 / 7771034442	Vanadium Sludge – 200 T/M	31.08.2019
5	Rover Ferro-Tech Private Limited, At - 5G/A, Heavy Industrial Area, Hotkhoj, Bhilai, Chhattisgarh E-mail : roverferrotech@gmail.com Mobile : 9425234231	Vanadium Sludge – 100 T/M	01-09-2019
6	Star Alloys & Chemicals Pvt. Ltd., Plot No. 68,69 & 70 Industrial Area, Rajgamar Road, Korba, Chhattisgarh - 495677 E-mail : staralloyskorba@gmail.com Mobile : 9425532292 / 7759 221292	Vanadium Sludge – 417 T/A	04.05.2019
7	Gurushree Industries Private Limited, At - Delari, Po - Gerwani, Dist – Raigarh, Chhattisgarh E-mail : gsi.alloys@gmail.com Mobile : 7008481581	Vanadium Sludge – 46.66 T/M	13.08.2019
8	Cosmo Agromet Industries, At – Plot No. – 409, Industrial Area, Phase – 1, Panchkula – 134113, Haryana E-mail : cosmoagromet@yahoo.com Mobile : 9814334856	Zinc Dross /Ash / Skimmings – 11,724 T/A Brass Dross – 5,400 T/A	06-02-2022
9	G M Admixtures, At-Plot No. 189, Industrial Area, Phase-I, Panchkula, Haryana-134109 E-mail : gmadmixtures@gmail.com Mobile : 9816631328	Zinc Dross / Ash / Skimming - 6,000 T/A	05-02-2022
10	Neelam Metal Products , At – F-40, RIICO Industrial Area, Odela Road, Dholpur, Rajasthan-21 E-mail : neelammetalproducts@gmail.com Mobile : 98370251	Zinc Dross /Ash / Skimmings / Scrap 900 T/A Copper Scrap / Copper wire - 39.96 T/A	31.03.2021
11	R K Products, Village -Mahishrekha, PS - Uluberia, Dangadi, Dist - Howrah, West Bengal E-mail : banerjee.shiv1@gmail.com Mobile : 8910302315	Zinc Dross / Ash / Skimming - 7,200 T/A	31-12-2020

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
12	Bachhelal Metal Industries, At/Po - 22G Shiv Krishna Daw Lane, Kolkata, West Bengal – 700054 E-mail : bachhelalmetalindustries2015@rediffmail.com Mobile : 9830836045	Lead acid battery plates / ashes / residue / scraps - 4,320 T/A	31-10-2020
13	OM Industries, 7 K. M. Stone, VPO- Titoli, Jind Road, Rohtak, Haryana-124001, India E-mail : happykumarkamra@ymail.com Mobile : 8076652698	Used Oil - 1,000 KL/A	31-03-2021
14	Bharat Petro Industries, At - Khasra No. 2, Plot No - 3A, Khodamatand Area, Udaipur, Madanganj, Dist – Ajmer, Rajasthan - 305801 E-mail : bharatpetroind@gmail.com Mobile : 9269166829	Used Oil - 2,000 KL/A Waste Oil - 800 KL/A	31.03.2023
15	Haryana Petro Oils, At - Plot No. 31, Phase - III rd, Industrial area, Sirsa, Haryana E-mail : sachin_love82@yahoo.com / haryanapetrooil@yahoo.com Mobile : 9215655572/76	Used Oil / Waste Oil - 500 KL/A	29.06.2019
16	JMR Petro Industries, At - Plot No. - EE - 24, AIE Pedagantyada, Gajuwaka, Visakhapatnam, A.P E-mail : jmrpetro@gmail.com Mobile : 9866678645 / 9963487854	Used Oil - 250 KL/A Waste Containing Oil - 2,000 KL/A	30-11-2019
17	K M Oils Pvt. Ltd., Plot No-75, 76, 77(A-Part) 2nd Phase, Kapnoor Industrial Area, Kalaburagi, Banagalore Mobile : 9886927866	Used Oil - 1,500 KL/A Waste Oil - 3,000 KL/A	30-06-2020
18	Lakhdata Petro Chemicals, At-Ramsara, Near GGS Refinery Main Gate, Bhatinda, Punjab E-mail : lakhdatachemical@gmail.com Mobile : 9810015932	Used Oil - 200 KL/A Waste Oil - 1,000 KL/A	30-09-2022
19	Lubrina Recycling Pvt. Ltd., Joy Chandipur, PO- Bakrahat, PS- Bishnupur, Dist - 24 Parganas (South), West Bengal – 743377 E-mail : aashish@lubrinare.com Mobile : 9874290909 / 9831151692	Used Oil - 4,800 KL Waste Oil - 1,800 KL	10.08.2019
20	National Lubricants, At - Gut No. - 495/498 (P), Plot No. - 29, Vill - Kondale, Tal. - Wada, Dist - Palghar, Maharashtra - 421312 E-mail : info@nationallubricants.in Mobile : 9820520853	Used Oil - 1,500 KL/A Waste Oil - 1,500 KL/A	31-03-2020

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
21	Plus Lubricants, Gvt No.-228, Survey No.-43, Satepada Road, City-Abhitghar-421303, Thane, Maharashtra E-mail : pluslubricants@pluslubricants.in Mobile : 9867421136 / Ph : 022-2666-5151	Used Oil -1000 KL/A Waste Oil - 3000 KL/A	19-05-2019
22	R. S. Oil Industries, Junglepur, Jalan Industrial Complex, Baniyara, Begri (G.P.), Domjur, Howrah - 711 411 E-mail : rsoilind90@gmail.com Phone : 033 - 24598574 / 8576	Used Oil - 100 KL Waste Oil - 1500 KL	31.03.2020
23	Sri Lakshmi Narayana Industries At - Pidimgoyyi (V), Rajahmundry, Dist - East Godavari, Andhra Pradesh E-mail : krishna.nsr111@gmail.com Mobile : 9396622208	Used Oil - 500 KL/A Waste Oil - 1,000 KL/A	11-01-2020
24	Tanu Petrochem Products Private Limited, Plot No - 238, Phase - II, I.D.A, Pashamylarm, Dist - Medak, Andhra Pradesh – 502307 E-mail : tanu_petrochem@yahoo.com Mobile : 9885082850	Used Oil - 1,000 KL/A Waste Oil - 3,000 KL/A	30-09-2022
25	Premier Petrochem, Plot No - 01, G No -185, KIDC Industrial Estate, Vill - Dheku, Taluka - Khalapur, Dist - Raigad, Maharashtra E-mail : premierpetrochem8@gmail.com Mobile :09869024008	Waste Oil - 1,500 KL/A	31-03-2020

(B) Common Facility for Disposal of Hazardous Wastes

A Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) has been established during financial year 2010-11 at Kanchichuan, Jajpur, Odisha operated by M/s Ramky Enviro Engineers Ltd., Hyderabad with consented capacity of 75,000 T/A. So far, 179 no. of Industries / Mines have taken membership agreement with Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF).

The status of disposal of hazardous waste at CHWTSDF is as follows:

Hazardous waste received from various Industries/Mines by CHWTSDF -59,098.32 T

i. Landfill after treatment - 44,613.49 T
ii. Direct Landfill - 14,484.83 T

5.6.2. Implementation of Manufacture, storage and Import of Hazardous Chemical Rules, 1989 and amendments thereof

The Board has not received any application for import of Hazardous Chemicals to the State during 2018-19.

5.6.3. Implementation of Public Liability Insurance Act, 1991

As per provisions of the Public Liability Insurance Act, 1991, the industries handling hazardous substances above the regulatory quantity are required to take insurance policy

for providing immediate relief to the victims in case of chemical accidents. Efforts have been made to create awareness among the concerned industries to take such insurances. During this period 15 nos. of industries handling hazardous chemicals have renewed their insurance policies under the PLI Act, 1991.

5.6.4. Implementation of Batteries (M & H) Rule, 2001

The Board has received 101 nos. of half yearly returns from April' 2018 to Sep' 2018 and 35 nos. of half yearly returns from Oct' 2018 to March' 2019 from battery units. These returns have been received from Manufacturer, Re-conditioner, Assembler, Dealer, Bulk Consumer, Auctioneer, Importer & Recycler.

5.6.5 Implementation of the Biomedical Waste Management Rules, 2016

It is the prime responsibility of every occupier of the **Health Care Establishments (**HCE) generating Biomedical Wastes (BMWs) to ensure requisite management and disposal of wastes as per the Biomedical Waste Management Rules, 2016. Biomedical wastes generated in different HCEs are required to be disposed off safely without causing any adverse impacts on the environment and human health.

5.6.5.1 Inventorisation of Health Care Establishments (HCE)

The Board has brought 3431 nos. of HCEs under the authorization administration under the Biomedical Waste Management Rules 2016 and the district wise distribution of such HCEs with respect to bed strength is given in Table- 5.14.

Table – 5.14 Districtwise Distribution of Health Care Establishment under Authorization Administration.

Sl. No.	District	< 50 beds	50 beds and < 200 beds	200 beds and <500 beds	500 beds and above	Other Category*	Total
1	Angul	49	09	01	0	75	134
2	Balangir	39	02	0	0	55	96
3	Balasore	63	03	01	0	114	181
4	Bargarh	43	03	0	0	72	118
5	Bhadrak	23	03	01	0	50	77
6	Boudh	05	01	0	0	09	15
7	Cuttack	235	22	02	01	244	504
8	Deogarh	09	01	0	0	01	11
9	Dhenkanal	43	04	0	0	25	72
10	Gajapati	15	03	0	0	1	19
11	Ganjam	118	07	0	01	102	228
12	Jagatsinghpur	27	03	0	0	45	75
13	Jajpur	40	0	01	0	62	103
14	Jharsuguda	30	03	0	0	44	77
15	Kalahandi	26	03	0	0	101	130
16	Kandhamal	10	02	0	0	48	60
17	Kendrapara	26	01	0	0	55	82
18	Keonjhar	50	05	0	0	91	146
19	Khordha	143	16	10	05	135	309

Sl. No.	District	< 50 beds	50 beds and < 200 beds	200 beds and <500 beds	500 beds and above	Other Category*	Total
20	Koraput	23	04	0	0	59	86
21	Malkangiri	28	01	0	0	21	50
22	Mayurbhanj	46	05	01	0	58	110
23	Nawarangpur	12	02	0	0	53	67
24	Nayagarh	36	03	01	0	56	96
25	Nuapada	08	03	0	0	04	15
26	Puri	50	01	01	0	32	84
27	Rayagada	27	03	01	0	63	94
28	Sambalpur	60	02	01	01	42	106
29	Sonepur	09	01	0	0	10	20
30	Sundargarh	68	10	04	01	183	266
	Total	**1361**	**126**	**25**	**9**	**1910**	**3431**
N.B: * Pathological Laboratories and Diagnostic Centers etc.							

5.6.5.2 Management of Biomedical Waste

- As per the provisions of the Biomedical Waste Management Rules, 2016 all the HCEs are required to treat and dispose different types of biomedical waste properly. Most of the Health Care Units in Odisha have taken up inhouse biomedical waste segregation, treatment and disposal method as specified in the rule.
- Three important Govt. Medical Colleges and Hospitals namely, S.C.B Medical College and Hospital (SCB MCH), Cuttack, M.K.C.G Medical College and Hospital (MKCG MCH), Berhampur and V.S.S Medical College and Hospital (VSS MCH), Burla, Sambalpur have developed their own infrastructures such as incinerator, shredder, microwave etc. which are being operated by engaging private agencies for the treatment of Biomedical Wastes. The agencies are: M/s. Medi-Aid Marketing Services - engaged by SCB MCH, MKCG MCH and M/s. Biotech Solution- engaged by VSS MCH. In addition, M/s. Medi-Aid Marketing Services is operating the biomedical waste management facility of Rourkela Govt. Hospital campus, Rourkela on Public Private Partnership mode. These two facilities are also being shared by other nearby small Government HCEs.
- The Common Biomedical Waste Treatment Disposal Facility (CBWTDF) namely M/s Saniclean Pvt. Ltd., at Tangiapada, Khordha is taking care of segregated biomedical waste of hospitals in Cuttack city, Bhubaneswar city, Jagatpur, Choudwar, Duburi, Jatni, Paradeep & Khordha town.
- Out of 3431 HCEs, 609 units are utilizing the services of aforesaid common facilities.

5.6.5.3 Status of Authorisation Application of Health Care Establishments

The authorisation application status of the HCEs during 2018-19 is presented in Table-5.15

Table - 5.15 Authorisation Status of HCEs During 2018-19

Sl. No.	Status of HCEs	
1	No. of applications received during 2018-19	578
2	No. of cases carried over from year 2017-18	652
3	**Total no. of applications received**	**1230**

Sl. No.	Status of HCEs	
4	No. of HCEs granted authorisation	651
5	No. of HCEs refused authorisation	01
6	Total no. of applications disposed	652
7	No. HCEs under evaluation / Incomplete application	578
8	No. of HCEs violating the Rules	07
9	No. of HCEs issued show cause notices	31
10	No. of inspection conducted	786

5.6.6. Implementation of the Solid Waste Management Rules, 2016

As per the Solid Waste Management Rules, 2016 the Urban Local Bodies (ULBs) are required to take action for proper management of municipal solid wastes, seek authorization for setting up and operation of waste processing and disposal facilities from the Board and submit the annual report in Form-II every year to the State Pollution Control Board, Odisha. The Board has been pursuing this matter with all urban local bodies since the enactment of the Rules.

29 ULBs of the State are having valid authorization. Though 07 nos. of ULBs have applied for authorization but those were not considered due to incomplete applications. The Board has issued show cause notice to 01 ULB.

5.6.7. Implementation of Plastic Waste Management Rules, 2016

As per the provision of Plastic Waste Management Rules, 2016, the Board has been declared as prescribed authority to issue or renew registration to manufacturer of plastic products, multilayered packaging and plastic waste recycling & processing units. Brand owners who sell their commodity/products using multilayered plastics for packaging need to obtain registration from the Board for managing the plastic waste. During the reporting period Board has issued registration to 13 plastic product manufacturing units (08 producer, 04 brand owner and 01 reprocessor).

5.6.8 Implementation of the E-Waste Management Rules, 2016.

After enforcement of E-waste Management Rules, 2016 i.e. on 01.10.2016, no individual E-waste collection centre is allowed to collect E-waste. However, the captive collection centres of Producer / Dismantler/ Recycler/ Refurbishers are only allowed to collect E-waste. The Board has granted authorization to 04 nos. E-waste dismantling units.

5.6.9. Construction and Demolition Waste Management Rules, 2016

- Ministry of Environment, Forest and Climate Change, Govt. of India has notified Construction and Demolition Waste Management Rules, 2016 on 29th March, 2016.This Rule shall be applicable to every waste resulting from construction, re-modeling, repair and demolition of any civil structure of individual or organisation or authority who generates construction and demolition waste such as building materials, debris & rubble etc.
- The authorities of Revenue Department, Housing & Urban Development Department, Works Department and Town Planning, Government of Odisha have been requested to take appropriate action for wide publicity of the Rules to create awareness amongst the local authorities and sensitize the general public about their responsibilities in handling such type of waste.

- All the construction and demolition waste generators have been requested through public notice in Daily News Papers to go through the aforesaid Rules which is available at the SPC Board website **www.ospcboard.org** and Ministry website **www.moef.nic.in.** Furthermore, the operators of the waste processing facilities have been asked to apply for authorization from State Pollution Control Board.

5.7 MONITORING NETWORK FOR WATER AND AIR QUALITY

5.7.1 National Water Quality Monitoring Programme (NWMP)

Inland Surface Water

The Board is monitoring the water quality of eleven river systems viz. Mahanadi, Brahmani, Baitarani, Rushikulya, Nagavali, Subarnarekha, Budhabalanga, Kolab, Vansadhara, Indravati and Bahuda at 127 stations under the CPCB assisted National Water Quality Monitoring Programme (NWMP); one station on Brahmani river and one station on Baitarani river under National River Conservation Programme (NRCP).

Board is also monitoring the water quality of other surface water bodies such as canals (Taladanda and Puri canals), ponds in Puri, Bhubaneswar, Angul and Jeypore, Lakes (Chilka, Anshupa and Tampara lakes), Atharabanki Creek and coastal water at Puri, Gopalpur and Paradeep under NWMP. Details of monitoring stations are given in Table-5.16.

The following water quality parameters are determined on monthly basis at all locations.

(a) *Physical parameters*: Temperature, pH, Alkalinity, Total suspended solids (TSS)

(b) *Indicators of Organic pollution*: Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Free ammonia – Nitrogen, Ammonical (Ammonium + ammonia) – Nitrogen, Total Kjeldahl Nitrogen (TKN)

(c) *Bacteriological parameters*: Total Coliform (TC) and Fecal Coliform (FC)

(d) *Mineral constituents*: Electrical Conductivity (EC), Total Dissolved Solids (TDS), Boron, Sodium Absorption Ratio (SAR), Total Hardness (TH) , Chloride, Sulphate, Fluoride.

(e) *Nutrients*: Nitrate (Nitrate + Nitrite) – Nitrogen, Phosphate – Phosphorous.

(f) Metals : Chromium (Cr) (total and hexavalent), Iron (Fe), Nickel (Ni), Copper (Cu), Zinc (Zn), Cadmium (Cd), Mercury (Hg), Lead (Pb) are determined only during lean period, that is, in the month of April or May.

(g) *Biological Indices* : Saprobic Index (SI) and Diversity Index (DI) are monitored only in the months of January, April and October.

Table-5.16 Surface Water Quality Monitoring Stations conducted by the Board under NWMP and NRCP

Sl. No.	Source of monitoring	Total No. of Stations		NWMP Sampling Locations
		NWMP	NRCP	Monthly
(A)	**River system**			
1.	Mahanadi	55	-	**Ib :** (1) Sundargarh, (2) Jharsuguda, (3) Brajarajnagar U/s, (4) Brajarajnagar D/s; **Bheden :** (5) Jharsuguda; **Hirakud reservoir :** (6) Hirakud; **Power Channel:** (7) Power Channel U/s (8), Power Channel D/s; **Mahanadi :** (9) Sambalpur U/s, (10) Sambalpur D/s, (11) Sambalpur FD/s at Shankarmath, (12) Sambalpur FD/s at Huma, (13) Sonepur U/s, (14) Sonepur D/s, (15) Tikarpada, (16) Narasinghpur, (17) Mundali, (18) Cuttack U/s, (19) Cuttack D/s, (20) Cuttack FD/s , (21) Paradeep U/s, (22) Paradeep D/s; **Ong :** (23) Dharuakhaman ; **Tel :** (24) Monmunda; **Kathajodi:** (25) Cuttack U/s, (26) Cuttack D/s, (27) Cuttack FD/s at Mattagajpur, (28) Cuttack FFD/s at Kamasasan; **Serua :** (29) Cuttack FD/s at Sankhatrasa; **Kuakhai:** (30) Bhubaneswar FU/s, (31) Bhubaneswar U/s; **Daya :** (32) Gelapur, (33) Bhubaneswar D/s, (34) Bhubaneswar FD/s, (35) Kanas; **Gangua :** (36) Near Rajdhani Engg. College, (37) Hanspal, (38) Samantarpur, (39) Vadimula; **Birupa:** (40) Choudwar D/s; **Kushabhadra :** (41) Bhingarpur, (42) Nimapara, (43) Gop; **Bhargavi :** (44) Chandanpur; **Mangala :** (45) Malatipatpur, (46) Golasahi; **Devi:** (47) Machhagaon; **Gobari :** (48) Kendrapada U/s, (49) Kendrapada D/s; **Nuna :** (50) Bijipur ; **Kusumi:** (51) Tangi; **Kansari:** (52) Banapur ; **Badasnkha:** (53) Langaleswar; **Sabulia :** (54) Rambha; and **Ratnachira :** (55) Kumardihi

Sl. No.	Source of monitoring	Total No. of Stations		NWMP Sampling Locations
		NWMP	NRCP	Monthly
2.	Brahmani	40	1	**Sankh :** (1) Sankh U/s; **Koel :** (2) Koel U/s; **Brahmani :** (3) Panposh U/s, (4) Panposh D/s, (5) Rourkela D/s, (6) Rourkela FD/s at Attaghat, (7) Rourkela FD/s at Biritola, (8) Bonaigarh, (9) Rengali, (10) Samal, (11) Talcher FU/s, (12) Talcher U/s, (13) Mandapal, (14) Talcher D/s, (15) Talcher FD/s, (16) Dhenkanal U/s, (17) Dhenkanal D/s, (18) Bhuban, (19) Kabatabandha, (20) Dharmasala U/s, (21) Dharmasala D/s *, (22) Pottamundai; **Nandira:** (23) Nandira U/s, (24) Nandira D/s ; **Kisindajhor :** (25) Kisinda jhor; **Kharasrota :** (26) Khanditara, (27) Binjharpur, (28) Aul; **Guradih nallah:** (29) Guradih nallah; **Badajhor :** (30) Badajhor; **Damsala :** (31) Dayanabill; **Gonda nallah :** (32) Marthapur; **Lingira :** (33) Angul U/s, (34) Angul D/s; **Ramiala :** (35) Kamakhyanagar; **Banguru nallah :** (36) Bangurunallah; **Singada jhor :** (37) Singadajhor; **Tikira :** (38) Kaniha U/s, (39) Kaniha D/s; **Bangurusingada jhor :** (40) Bangrusingada jhor ; and **Karo :** (41) Barbil
3.	Baitarani	13	1	**Kundra :** (1) Joda; **Kusei :** (2) Deogaon; **Baitarani :** (3) Naigarh, (4) Unchabali, (5) Champua, (6) Tribindha, (7) Joda, (8) Anandpur, (9) Jajpur, (10) Chandbali U/s and (11) Chandbali D/s*; **Salandi:** (12) Bhadrak U/s, (13) Bhadrak D/s; and **Dhamra :** (14) Dhamra
4.	Rushikulya	6	-	**Russelkunda reservoir :** (1) Russelkunda; **BadaNadi** : (2) Aska; **Rushikulya** : (3) Aska, (4) Nalabanta, (5) Madhopur and (6) Potagarh
5.	Nagavali	3	-	**Nagavali :** (1) Penta U/s, (2) Jaykaypur D/s and (3) Rayagada D/s
6.	Subarnarekha	1	-	**Subarnarekha** : (1) Rajghat
7.	Budhabalanga	4	-	**Budhabalanga** : (1) Baripada D/s, (2) Balasore U/s, (3) Balasore D/s; and **Sone :** (4) Hatigond
8.	Kolab	1	-	**Kerandi :** (1) Sunabeda
9.	Vamsadhara	2	-	**Vansadhara :** (1) Muniguda and (2) Gunupur
10.	Indravati	1	-	**Indravati :** (1) Nawarangpur
11.	Bahuda	1	-	**Bahuda :** (1) Damodarpally
	Sub Total	**127**	**2**	
(B)	**Canal**	**9**	**-**	**Taladanda canal :** (1) Jobra, (2) Ranihat, (3) Chatrabazar, (4) Nuabazar (5) Biribati, (6) Atharabanki; **Puri Canal :** (7) Hansapal, (8) Jagannathpur and (9) Chandanpur

Sl. No.	Source of monitoring	Total No. of Stations		NWMP Sampling Locations
		NWMP	NRCP	Monthly
(C)	**Ponds**	**8**	-	**Bhubaneswar :** (1) Bindusagar ; (4 bathing ghats on each side of the pond) **Puri :** (2) Narendra pokhari, (3) Markanda Pokhari, (4) Indradyumna tank, (5) Swetaganga, (6) Parvati sagar; **Angul :** (7) Raniguda ; and **Jeypore :** (8) Jagannathsagar
(D)	**Lakes**	**7**	-	**Chilka lake :** (1) Rambha, (2) Satapada ; **Anshupa lake** : (3) Kadalibari, (4) Sarandagarh, (5) Subarnapur , (6) Bishnupur **Tampara lake** : (7) Tampara lake
(E)	**Sea**	**3**	-	(1) Puri, (2) Gopalpur and (3) Paradeep
(F)	**Creek**	**1**	-	(1) Atharabanki creek
(G)	**STP**	**3**	-	
	Total	**160**		
** NRCP stations				

River Water Quality Monitoring

The annual average and range values of the criteria parameters such as pH, DO, BOD and TC, obtained during the year 2018 for the river water quality monitoring stations listed under Table-5.16 are given in Table-5.18. Water quality in respect of other parameters is given in Table-5.19.

From the point of view of assessment of the river water quality on the basis of its use to which the river is put by the community, the water quality should conform to either Class-B (outdoor bathing) or Class-C (drinking water source with conventional treatment followed by the disinfection). Comparison of the water quality has been made with respect to the tolerance limits stipulated for Class-C surface water bodies (IS : 2296-1982). Water quality data given in Table-5.18 indicate that out of the four critical parameters such as pH, DO, BOD and TC, parameters like pH and DO at most of the stations remained within the criteria limits, whereas BOD and/or TC have exceeded the criteria limits at several places. Non-compliance has been observed at 22 stations for TC alone, 2 stations for BOD alone, and 17 stations for both BOD & TC (Table-5.17). The probable cause of downgrading the water quality from its desired use, are of organic origin. A major contribution towards this is from the discharge of untreated domestic water from the townships to the nearby water bodies. Out of 129 stations, one station is monitored on drain.

Table-5.17 Water quality status of river monitoring stations during 2018

SL. NO.	RIVER SYSTEM	TOTAL NO. OF MONITORING STATIONS	CONFORMING STATIONS	NON-CONFORMING STATIONS		
				Both BOD & TC	BOD alone	TC alone
1	MAHANADI	55	33	13	-	9
2	BRAHMANI	41*	29	4	1	6
3	BAITARANI	14	9	-	-	5
4.	RUSHIKULYA	6	5	-	1	-
5.	NAGAVALI	3	3	-	-	-
6.	SUBARNAREKHA	1	1	-	-	-

SL. NO.	RIVER SYSTEM	TOTAL NO. OF MONITORING STATIONS	CONFORMING STATIONS	NON-CONFORMING STATIONS		
				Both BOD & TC	BOD alone	TC alone
7.	BUDHABALANGA	4	2	-	-	2
8	KOLAB	1	1	-	-	-
9.	VAMSADHARA	2	2	-	-	-
10.	INDRAVATI	1	1	-	-	-
11.	BAHUDA	1	1	-	-	-
TOTAL		129	87	**17**	**2**	**22**
* 1 station is Drain						

Water quality with respect to other parameters at all the monitoring stations except at Paradeep D/s, Devi at Macchagaon, Potagarh, Chandbali U/s, Chandbali D/s and Dhamra remain within the criteria limit for Class - C water quality as laid down under IS : 2296-1982 (Tolerance limits for inland surface water bodies). Water quality at Paradeep D/s, Devi at Macchagaon, Potagarh, Chandbali U/s, Chandbali D/s and Dhamra are greatly influenced by the tidal effect as these stations are very close to the river muhans.

Table-5.18 Annual Average and Range values of Four Criteria Parameters (January-December, 2018)

(A) Mahanadi River System (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Ib river												
1.	Sundargarh	12	7.3 (6.6-7.9)	7.0 (5.3-8.6)	1.0 (0.4-2.0)	2049 (45-3500)	0	0	C	C		
2.	Jharsuguda	12	7.8 (6.5-8.6)	7.7 (7.2-8.0)	1.0 (0.4-1.7)	1521 (110-4300)	0	0	C	C		
3.	Brajarajnagar U/s	12	7.8 (6.9-8.4)	7.6 (6.8-8.0)	1.0 (0.4-1.8)	1674 (20-3500)	0	0	C	C		
4.	Brajarajnagar D/s	12	7.9 (7.0-8.4)	7.6 (7.2-8.2)	1.6 (0.5-2.9)	2709 (45-4900)	0	0	C	C		
Bheden river												
5.	Jharsuguda	12	7.9 (7.2-8.4)	7.7 (7.4-8.2)	1.4 (0.6-2.8)	2277 (<1.8-16000)	0	1 (8)	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Hirakud reservoir												
6.	Hirakud reservoir	12	7.7 (6.6-8.3)	7.4 (6.7-9.0)	0.9 (0.3-1.7)	1592 (20-16000)	0	1 (8)	C	C		
Power Channel												
7.	Power Channel U/s	12	7.7 (6.6-8.3)	7.2 (5.2-8.1)	0.6 (0.3-1.1)	328 (<1.8-1400)	0	0	C	C		
8.	Power Channel D/s	12	7.6 (6.9-8.2)	7.2 (5.2-8.6)	1.0 (0.5-2.0)	795 (20-3500)	0	0	C	C		
Mahanadi river												
9	Sambalpur U/s	12	7.5 (6.6-8.3)	7.6 (6.9-8.4)	1.2 (0.6-1.7)	1355 (45-4900)	0	0	C	C		
10	Sambalpur D/s	12	7.6 (6.6-8.4)	7.4 (6.7-8.4)	1.6 (0.6-2.2)	5626 (130-22000)	0	4 (33)	C	Doesn't conform to Class C	TC	Waste water of Sambalpur town
11.	Sambalpur FD/s at Shankarmath	12	7.6 (6.7-8.4)	7.3 (6.0-8.2)	1.1 (0.5-1.8)	2850 (20-16000)	0	2 (17)	C	C		
12.	Sambalpur FF-D/s at Huma	12	7.7 (6.9-8.3)	7.4 (6.5-8.4)	0.9 (0.4-1.4)	2255 (170-9200)	0	1 (8)	C	C		
13.	Sonepur U/s	12	7.8 (6.9-8.3)	7.6 (6.7-8.4)	0.8 (0.2-1.5)	151 (<1.8-460)	0	0	C	C		
14.	Sonepur D/s	12	7.7 (7.0-8.4)	7.0 (6.1-7.8)	1.2 (0.4-2.1)	641 (130-3500)	0	0	C	C		
15.	Tikarapada	12	7.8 (6.7-8.4)	8.0 (6.4-10.2)	0.7 (0.2-1.5)	766 (20-3500)	0	0	C	C		
16.	Narasinghpur	12	7.8 (6.7-8.5)	8.1 (7.4-10.0)	0.6 (0.4-0.9)	723 (20-3500)	0	0	C	C		
17.	Mundali	12	7.8 (7.2-8.4)	8.1 (7.2-9.8)	0.7 (0.3-1.1)	614 (78-1300)	0	0	C	C		
18.	Cuttack U/s	12	7.9 (7.1-8.4)	7.9 (6.8-10.2)	0.7 (0.3-1.0)	930 (45-2400)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
19.	Cuttack D/s	12	7.8 (7.2-8.3)	7.5 (6.4-9.8)	1.3 (0.6-2.3)	4866 (790-16000)	0	4 (33)	C	Doesn't conform to Class C	TC	Waste water of Cuttack city
20.	Cuttack FD/s	12	7.9 (7.3-8.5)	7.6 (6.6-9.6)	1.0 (0.6-1.7)	4057 (490-16000)	0	2 (17)	C	C		
21.	Paradeep U/s	12	7.8 (6.9-8.0)	7.4 (6.2-8.6)	1.0 (0.4-1.5)	973 (<1.8-3500)	0	0	C	C		
22.	Paradeep D/s	12	7.6 (7.0-8.1)	7.4 (6.8-8.2)	1.0 (0.3-1.8)	146 (<1.8-490)	0	0	C	C		
Ong River												
23.	Dharuakhaman	12	7.9 (6.4-8.5)	7.7 (6.7-8.4)	0.8 (0.2-2.7)	594 (<1.8-5400)	0	1 (8)	C	C		
Tel River												
24.	Monmunda	12	7.7 (6.5-8.3)	7.4 (6.6-8.4)	1.0 (0.3-1.9)	345 (<1.8-1300)	0	0	C	C		
Kathajodi river												
25.	Cuttack U/s	12	7.7 (6.5-8.1)	7.7 (6.9-8.4)	0.7 (0.4-1.4)	1703 (140-5400)	0	1 (8)	C	C		
26.	Cuttack D/s	12	7.7 (6.8-8.4)	6.4 (4.6-8.4)	2.8 (0.7-5.7)	46758 (790-160000)	6 (50)	10 (83)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city
27.	Mattagajpur (Cuttack FD/s)	12	7.8 (6.9-8.5)	6.7 (4.2-9.2)	2.6 (0.8-3.9)	23416 (790-92000)	5 (42)	11 (92)	C	Doesn't conform to Class C	BOD, TC	
28.	Kamasasan (Cuttack FFD/s)	12	7.7 (7.2-8.1)	7.5 (6.6-8.6)	1.2 (0.5-2.6)	1532 (78-4900)	0	0	C	C		
Serua River												
29.	Sankhatrasa (Cuttack FD/s)	12	7.7 (7.1-8.5)	6.9 (5.6-7.8)	2.4 (0.6-5.5)	25494 (230-160000)	5 (42)	7 (58)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Kuakhai river												
30	Bhubaneswar FU/s	12	7.6 (6.7-8.4)	7.4 (5.5-8.7)	1.0 (0.4-1.5)	1432 (330-3500)	0	0	C	C		
31.	Bhubaneswar U/s	12	7.6 (6.5-8.3)	7.3 (5.3-9.7)	1.1 (0.6-1.6)	2800 (1300-3500)	0	0	C	C		
Daya river												
32.	Gelapur	12	7.5 (7.0-8.3)	8.2 (6.0-9.9)	1.0 (0.5-1.9)	2695 (170-16000)	0	2 (17)	C	C		
33.	Bhubaneswar D/s	12	7.4 (6.7-8.2)	4.2 (1.1-7.8)	4.6 (1.5-7.4)	72583 (13000-160000)	9 (75)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	Waste water of Bhubaneswar city
34.	Bhubaneswar FD/s	12	7.3 (6.8-8.1)	5.1 (1.4-11.1)	4.3 (1.3-7.4)	54358 (3300-160000)	9 (75)	11 (92)	C	Doesn't conform to Class C	DO##, BOD, TC	
35.	Kanas	12	7.7 (6.9-8.4)	6.5 (3.8-8.9)	2.2 (0.8-4.4)	8092 (200-16000)	2 (17)	10 (83)	C	Doesn't conform to Class C	DO###, BOD, TC	Human activities
# Frequency of violation for DO is 6 times (50 % of total observation) ## Frequency of violation for DO is 5 times (42% of total observation) ### Frequency of violation for DO is 1 time (8 % of total observation)												
Gangua River												
36.	Near Rajdhani Engg. College	12	7.1 (6.5-7.6)	1.9 (0.4-4.6)	14.2 (3.6-31.3)	153818 (92000-160000)	12 (100)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	Waste water of Bhubaneswar city
37.	Palasuni	12	7.1 (6.5-7.7)	1.7 (0.5-3.2)	15.0 (4.1-34.3)	154333 (92000-160000)	12 (100)	12 (100)	C	Doesn't conform to Class C	DO##, BOD, TC	
38.	Samantray pur	12	7.2 (6.7-7.9)	1.1 (0.2-3.8)	22.4 (3.6-70.8)	151167 (54000-160000)	12 (100)	12 (100)	C	Doesn't conform to Class C	DO##, BOD, TC	
39.	Vadimula	12	7.3 (6.7-8.1)	3.2 (0.7-6.6)	8.1 (3.4-16.3)	123533 (5400-160000)	12 (100)	12 (100)	C	Doesn't conform to Class C	DO###, BOD, TC	

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Birupa River												
40.	Choudwar D/s	12	7.7 (6.7-8.2)	8.0 (6.6-9.2)	0.9 (0.4-1.8)	2003 (40-3500)	0	0	C	C		
Kushabhadra River												
41.	Bhingarpur	12	7.8 (6.9-8.4)	7.0 (5.1-10.0)	1.6 (0.7-2.5)	3911 (130-9200)	0	2 (17)	C	C		
42.	Nimapara	12	7.8 (7.0-8.5)	7.0 (5.5-8.5)	1.3 (0.7-2.4)	3442 (78-16000)	0	2 (17)	C	C		
43.	Gop	12	7.8 (7.0-8.5)	6.7 (5.2-8.2)	1.2 (0.5-2.2)	6199 (790-17000)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
# Frequency of violation for DO is 11 times (92% of total observation) ## Frequency of violation for DO is 12 times (100% of total observation) ### Frequency of violation for DO is 9 times (75% of total observation)												
Bhargavi River												
44.	Chandanpur	12	8.0 (7.4-8.5)	7.0 (4.3-10.3)	1.1 (0.5-2.0)	3285 (330-16000)	0	1 (8)	C	C		
Mangala River												
45.	Malatipatpur	12	7.6 (6.6-8.4)	6.5 (4.8-8.6)	1.1 (0.4-1.7)	2734 (490-9200)	0	2 (17)	C	C		
46.	Golasahi	12	7.7 (7.2-8.4)	6.5 (3.2-11.6)	3.6 (1.3-5.8)	8108 (1300-17000)	8 (67)	9 (75)	C	Doesn't conform to Class C	DO#, BOD, TC	Human activities
Devi River												
47.	Machhagaon	12	7.6 (7.2-8.2)	7.0 (6.2-7.6)	0.8 (0.3-1.4)	621 (<1.8-3500)	0	0	C	C		
Gobari River												
48.	Kendrapara U/s	12	7.8 (7.1-8.4)	6.7 (5.2-7.6)	1.3 (0.3-2.2)	9018 (330-43000)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
49.	Kendrapara D/s	12	7.7 (7.0-8.4)	6.5 (4.4-7.8)	1.8 (0.8-2.5)	22008 (790-92000)	0	10 (83)	C	Doesn't conform to Class C	TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Nuna River												
50.	Bijipur	12	7.8 (7.0-8.5)	6.5 (5.6-8.4)	1.3 (0.2-2.7)	5265 (490-16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Kusumi River												
51.	Tangi	12	7.8 (7.3-8.3)	7.0 (6.2-8.4)	1.2 (0.4-1.7)	4543 (330-16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
# Frequency of violation for DO is 1 time (8% of total observation)												
Kansari River												
52.	Banapur	12	7.8 (6.7-8.4)	6.6 (4.4-8.4)	1.6 (0.6-3.6)	7586 (330-35000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Badasankha River												
53.	Langaleswar	12	7.8 (7.1-8.4)	6.7 (3.3-10.1)	2.4 (0.6-5.4)	4243 (330-16000)	4 (33)	3 (25)	C	Doesn't conform to Class C	DO#,BOD, TC	Human activities
Sabulia River												
54.	Rambha	12	8.0 (7.5-8.5)	6.5 (4.1-8.6)	1.5 (0.8-2.4)	4636 (230-16000)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
Ratnachira River												
55.	Kumardihi	12	7.8 (7.1-8.5)	6.8 (3.1-8.7)	1.8 (0.5-3.5)	5825 (460-16000)	1 (8)	4 (33)	C	Doesn't conform to Class C	DO#,BOD, TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

Frequency of violation for DO is 1 time (8% of total observation)

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.(Ref : IS 2296-1982 foot note)

(B) Brahmani river System (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Sankh river												
1.	Sankh U/s	12	7.5 (6.7-8.1)	6.8 (4.8-8.2)	1.2 (0.4-1.8)	4901 (330-16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Koel River												
2.	Koel U/s	12	7.6 (6.7-8.3)	6.7 (4.5-8.0)	1.1 (0.4-2.5)	3966 (68->16000)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
Brahmani river												
3.	Panposh U/s	12	7.5 (6.8-8.3)	7.4 (5.6-9.0)	1.3 (0.5-2.0)	3956 (580-16000)	0	2 (17)	C	C		
4.	Panposh D/s	12	7.5 (6.6-8.2)	5.0 (3.5-7.4)	4.8 (1.5-7.6)	35858 (5400-92000)	11 (92)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	Waste water of Rourkela town and Steel Plant
5.	Rourkela D/s	12	7.4 (6.6-8.2)	5.2 (3.7-7.8)	4.2 (1.3-6.5)	20217 (1300-92000)	11 (92)	11 (92)	C	Doesn't conform to Class C	DO##, BOD, TC	-do-
6.	Rourkela FD/s (Attaghat)	12	7.4 (6.9-8.2)	6.5 (4.6-8.6)	3.1 (0.8-5.4)	6671 (92-24000)	6 (50)	7 (58)	C	Doesn't conform to Class C	BOD, TC	-do-
7.	Rourkela FD/s (Biritola)	12	7.6 (6.7-8.2)	7.2 (5.2-8.2)	1.4 (0.4-2.8)	2216 (45-9200)	0	2 (17)	C	C		
# Frequency of violation for DO is 4 times (33% of total observation) ## Frequency of violation for DO is 1 time (8% of total observation)												
8.	Bonaigarh	12	7.7 (7.0-8.2)	7.3 (4.9-9.0)	1.3 (0.1-2.2)	860 (20-3500)	0	0	C	C		
9.	Rengali	12	7.7 (6.9-8.2)	7.9 (6.0-9.0)	0.8 (0.5-1.5)	626 (68-1600)	0	0	C	C		
10.	Samal	12	7.7 (7.1-8.3)	8.0 (4.8-9.2)	0.8 (0.2-1.9)	1180 (130-3500)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
11.	Talcher FU/s	12	7.7 (7.1-8.3)	8.0 (7.2-9.0)	0.7 (0.4-1.1)	1427 (78-5400)	0	1 (8)	C	C		
12.	Talcher U/s	12	7.8 (7.2-8.2)	7.8 (6.4-8.6)	0.8 (0.5-1.2)	1816 (130-9200)	0	1 (8)	C	C		
13.	Mandapal	12	7.7 (7.1-8.2)	7.8 (6.8-8.4)	1.2 (0.6-2.6)	3226 (170-16000)	0	2 (17)	C	C		
14.	Talcher D/s	12	7.6 (6.6-8.1)	7.8 (6.9-8.8)	1.2 (0.2-2.8)	3027 (230-11000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
15.	Talcher FD/s	12	7.6 (7.0-8.1)	8.0 (6.4-9.1)	0.8 (0.2-1.4)	2085 (230-7900)	0	2 (17)	C	C		
16.	Dhenkanal U/s	12	7.7 (7.3-8.2)	8.2 (7.2-9.4)	0.7 (0.2-1.0)	1621 (130-9200)	0	1 (8)	C	C		
17.	Dhenkanal D/s	12	7.7 (7.3-8.0)	8.0 (6.4-9.2)	1.0 (0.2-2.0)	3502 (270-17000)	0	2 (17)	C	C		
18.	Bhuban	12	7.8 (7.3-8.3)	7.9 (6.8-9.0)	0.8 (0.2-1.9)	715 (20-2400)	0	0	C	C		
19.	Kabatabandha	12	7.7 (6.3-8.4)	7.2 (6.4-7.6)	0.5 (0.2-0.8)	1149 (20-4300)	0	0	C	C		
20.	Dharmasala U/s	12	7.6 (6.4-8.2)	7.4 (6.8-7.9)	0.6 (0.2-0.9)	1227 (110-3500)	0	0	C	C		
21.	Dharmasala D/s	12	7.7 (6.7-8.4)	7.3 (6.6-7.6)	1.1 (0.6-1.6)	1847 (78-5400)	0	1 (8)	C	C		
22.	Pottamundai	12	7.8 (7.0-8.4)	7.4 (6.0-9.2)	1.2 (0.7-1.8)	1719 (170-4300)	0	0	C	C		
Nandira river												
23.	Nandira U/s	12	7.9 (7.3-8.4)	7.4 (5.8-8.4)	1.1 (0.6-2.5)	3921 (45 - >16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
24.	Nandira D/s	12	8.0 (7.4-8.5)	7.3 (5.8-8.8)	1.6 (0.8-3.5)	7551 (330-35000)	1 (8)	4 (33)	C	Doesn't conform to Class C	BOD, TC	Human activities
Kisindajhor												
25.	Kisindajhor	12	8.0 (7.6-8.3)	6.9 (4.6-8.2)	1.1 (0.6-2.1)	2133 (78-5400)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Kharasuan River												
26.	Khanditara	12	7.6 (6.8-8.1)	7.7 (6.4-8.4)	0.8 (0.3-1.4)	789 (45-3500)	0	0	C	C		
27.	Binjharpur	12	7.8 (7.1-8.3)	7.9 (7.2-8.6)	0.7 (0.3-1.6)	1169 (45-5400)	0	1 (8)	C	C		
28.	Aul	12	7.8 (7.3-8.4)	7.3 (6.2-8.6)	1.2 (0.3-2.0)	2390 (45-5400)	0	1 (8)	C	C		
Guradih nallah												
29.	Guradih nallah	12	7.4 (6.8-7.9)	3.4 (1.8-6.4)	7.0 (3.3-10.1)	70750 (11000->160000)			Drain			
Badjhor nallah												
30.	Badjhor nallah	12	8.0 (7.7-8.3)	7.2 (6.6-8.3)	0.9 (0.4-1.5)	7173 (490-54000)	0	2 (17)	C	C		
Damsala River												
31.	Dayanabil	12	7.8 (7.0-8.5)	7.3 (6.4-8.3)	0.7 (0.3-1.4)	1884 (45-4600)	0	0	C	C		
Ganda nallah												
32.	Marthapur	12	7.8 (7.2-8.2)	7.5 (6.4-8.2)	1.0 (0.4-2.4)	10964 (20-92000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Lingira River												
33.	Angul U/s	12	8.3 (7.7-8.8)	7.7 (6.2-9.0)	1.0 (0.3-1.8)	2183 (45-16000)	0	1 (8)	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
34.	Angul D/s	12	8.3 (7.8-8.8)	7.3 (5.8-8.6)	1.1 (0.5-2.2)	2299 (78-9200)	0	1 (8)	C	C		
Ramiala River												
35.	Kamakhyanagar	12	8.0 (7.5-8.5)	7.8 (4.4-9.4)	1.0 (0.3-1.8)	1397 (78-3500)	0	0	C	C		
Banguru nallah												
36.	Banguru nallah	12	8.1 (7.6-8.5)	7.5 (5.2-9.0)	1.3 (0.5-3.9)	1248 (130-2400)	1 (8)	0	C	Doesn't conform to Class C	BOD	Human activities
Singada jhor												
37.	Singada jhor	12	8.1 (7.5-8.5)	7.9 (5.8-10.0)	1.2 (0.7-2.1)	980 (45-4300)	0	0	C	C		
Tikira River												
38.	Kaniha U/s	12	8.1 (7.9-8.3)	8.0 (7.0-9.6)	0.8 (0.4-1.5)	1163 (110-3500)	0	0	C	C		
39.	Kaniha D/s	12	7.9 (6.7-8.4)	7.3 (5.8-8.2)	1.1 (0.6-2.5)	2520 (110-9200)	0	1 (8)	C	C		
Bangurusingada jhor												
40.	Bangurusingada jhor	12	8.1 (7.7-8.5)	7.3 (5.2-8.8)	1.1 (0.1-2.5)	2775 (20-9200)	0	1 (8)	C	C		
Karo River												
41.	Barbil	12	7.6 (6.4-8.5)	7.0 (6.0-7.7)	0.9 (0.1-1.9)	1744 (78-4300)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

(C) Baitarani river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Kundra nallah												
1.	Joda	12	7.6 (6.9-8.4)	6.9 (6.0-8.3)	1.2 (0.3-2.1)	1636 (68-4300)	0	0	C	C		
Kusei River												
2.	Deogaon	12	7.9 (7.0-8.5)	7.6 (7.1-9.6)	1.2 (0.7-2.2)	3306 (390-5400)	0	1 (8)	C	C		
Baitarani River												
3.	Naigarh	12	7.7 (6.7-8.4)	7.5 (6.2-8.9)	0.8 (0.4-1.8)	842 (78-3500)	0	0	C	C		
4.	Unchabali	12	7.5 (6.0-8.4)	7.5 (6.2-8.9)	0.8 (0.4-1.8)	842 (78-3500)	0	0	C	C		
5.	Champua	12	7.5 (6.8-8.3)	7.1 (6.0-7.8)	1.0 (0.3-2.4)	1289 (78-3500)	0	0	C	C		
6.	Tribindha	12	7.7 (6.9-8.3)	7.4 (6.4-8.2)	0.9 (0.4-2.2)	1061 (78-3500)	0	0	C	C		
7.	Joda	12	7.6 (6.9-8.3)	7.5 (6.2-8.7)	0.7 (0.4-1.3)	1089 (20-3500)	0	0	C	C		
8.	Anandpur	12	7.6 (7.0-8.4)	7.5 (6.8-8.1)	1.0 (0.5-2.0)	1805 (170-360)	0	0	C	C		
9.	Jajpur	12	7.9 (7.4-8.4)	7.6 (6.5-8.4)	0.7 (0.3-1.4)	4556 (78-16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
10.	Chandbali U/s	12	7.9 (7.1-8.4)	7.4 (5.6-9.2)	0.9 (0.5-2.1)	8267 (1100-16000)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
11.	Chandbali D/s	12	7.8 (7.3-8.2)	7.4 (6.0-8.8)	1.3 (0.4-1.9)	8335 (920-16000)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
Salandi River												
12.	Bhadrak U/s	12	7.9 (7.1-8.4)	7.5 (5.2-9.2)	0.8 (0.3-1.2)	2391 (490-5400)	0	1 (8)	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
13.	Bhadrak D/s	12	7.8 (6.4-8.4)	7.7 (5.6-9.6)	1.1 (0.7-1.8)	9823 (790-54000)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
Dhamra River												
14.	Dhamra	12	7.7 (6.9-8.1)	7.2 (5.6-8.8)	0.9 (0.4-1.9)	5028 (330-16000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note

(D) Rushikulya river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Russelkunda Reservoir												
1.	Russelkunda	12	7.6 (7.0-8.3)	8.1 (6.0-9.8)	1.2 (0.8-2.0)	1716 (<1.8-4300)	0	0	C	C		
Bada Nadi												
2	Aska	12	8.0 (7.4-8.4)	8.2 (6.5-9.5)	1.0 (0.3-1.8)	1414 (170-4300)	0	0	C	C		
Rushikulya River												
3.	Aska	12	7.9 (6.9-8.5)	7.6 (6.0-8.6)	0.9 (0.4-1.5)	2508 (230-5400)	0	1 (8)	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
4.	Nalabanta	12	8.0 (7.5-8.4)	7.7 (6.0-10.0)	1.1 (0.4-1.8)	1906 (61-5400)	0	1 (8)	C	C		
5.	Madhopur	12	8.0 (7.4-8.4)	7.9 (6.2-10.5)	1.4 (0.6-2.6)	2642 (<1.8-4300)	0	0	C	C		
6.	Potagarh	12	7.8 (7.5-8.4)	7.8 (6.8-10.1)	2.0 (0.9-3.7)	1126 (<1.8-3500)	2 (17)	0	C	Doesn't conform to Class C	BOD	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(E) Nagavali river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Nagavali river												
1.	Penta U/s	12	7.6 (6.4-8.3)	7.4 (6.9-7.8)	0.9 (0.4-1.5)	1103 68-3500	0	0	C	C		
2.	J.K. Pur D/S	12	7.7 (6.7-8.4)	6.7 (6.3-7.0)	1.6 (0.8-2.8)	3364 (700-16000)	0	2 (17)	C	C		
3.	Rayagada D/S	12	7.7 (6.6-8.4)	7.3 (7.0-7.6)	1.1 (0.5-2.1)	1391 (170-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml. (Ref : IS 2296-1982 foot note)

(F) Subarnarekha river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Subarnarekha river												
1.	Rajghat	12	8.0 (6.9-8.5)	7.5 (6.4-8.8)	1.0 (0.3-1.6)	2162 (170-4900)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

(G) Budhabalanga river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Budhabalanga river												
1.	Baripada D/s	12	7.9 (6.8-8.5)	8.1 (6.8-9.6)	1.0 (0.6-1.6)	7923 (680-54000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
2.	Balasore U/s	12	7.8 (7.0-8.3)	7.5 (6.4-8.8)	1.0 (0.2-2.3)	3149 (790-9200)	0	1 (8)	C	C		
3.	Balasore D/s	12	7.8 (7.0-8.4)	6.9 (5.2-8.2)	1.6 (1.0-2.8)	17567 (3500-54000)	0	7 (58)	C	Doesn't conform to Class C	TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Sone River												
4.	Hatigond	12	7.7 (6.9-8.4)	7.3 (5.0-8.4)	1.2 (0.4-2.3)	2107 (220-4300)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

(H) Kolab river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Kerandi River												
1.	Sunabeda	12	7.6 (7.2-8.1)	7.3 (7.0-7.8)	0.7 (0.3-1.4)	1593 (78-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

(I) Vansadhara river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Vansadhara River												
1.	Muniguda	12	7.7 (6.6-8.4)	7.3 (6.7-7.9)	0.8 (0.5-1.5)	638 (20-1700)	0	0	C	C		
2.	Gunupur	12	7.8 (6.6-8.4)	7.4 (7.1-8.1)	0.9 (0.2-1.6)	1339 (20-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml. (Ref : IS 2296-1982 foot note)

J) Indravati river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Indravati River												
1.	Nawaranngpur	12	7.6 (6.8-8.3)	7.4 (7.0-8.1)	0.7 (0.2-1.7)	537 (40-2400)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml. (Ref : IS 2296-1982 foot note)

(K) Bahuda river system (2018)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	BOD	TC				
Bahuda River												
1.	Damodarpally	12	8.1 (7.6-8.4)	7.5 (6.0-9.2)	0.9 (0.5-1.5)	1411 (170-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**			**Drinking water source with conventional treatment followed by disinfection**			

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml. (Ref : IS 2296-1982 foot note)

Table-5.19 Water quality with respect to Other Parameters during 2018 (January-December)

(A) Mahanadi River System (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
Ib river																
1.	Sundargarh	114 (2-426)	64 (42-88)	9.4 (5.0-24.1)	0.191 (BDL-0.450)	0.003 (0-0.010)	4.29 (0.56-13.44)	788 (20-2200)	156 (111-212)	0.39 (0.28-0.86)	0.011 (<0.003-0.028)	93 (66-122)	55 (36-88)	10.40 (7.40-20.20)	7.77 (1.74-19.40)	0.35 (0.22-0.61)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
2.	Jharsuguda	69 (1-370)	62 (44-76)	8.9 (6.1-13.9)	0.204 (0.056-0.560)	0.007 (0-0.034)	3.32 (0.28-13.44)	757 (20-3500)	210 (114-648)	0.77 (0.20-3.66)	0.043 (0.005-0.162)	123 (68-352)	65 (48-98)	24.59 (5.78-139.00)	12.77 (1.71-38.06)	0.39 (0.25-0.60)
3.	Brajra-jnagar U/s	138 (3-804)	74 (32-186)	9.5 (5.2-15.8)	0.204 (0.056-0.560)	0.007 (0-0.022)	2.59 (0.56-7.84)	652 (<1.8-1700)	180 (107-392)	0.35 (0.18-0.76)	0.039 (<0.003-0.136)	109 (58-218)	73 (30-162)	9.88 (5.78-17.70)	13.45 (8.28-24.13)	0.39 (0.21-0.81)
4.	Brajra-jnagar D/s	78 (2-378)	85 (40-208)	13.0 (8.1-18.5)	0.242 (0.056-0.790)	0.013 (0-0.077)	2.43 (0.56-6.16)	1198 (<1.8-2600)	214 (111-534)	0.46 (0.19-0.91)	0.047 (0.003-0.088)	131 (67-299)	83 (38-186)	14.87 (5.78-44.97)	16.48 (7.8-31.47)	0.46 (0.25-1.50)
Bheden river																
5.	Jharsuguda	117 (1-614)	76 (20-124)	12.8 (7.8-20.0)	0.158 (BDL-0.450)	0.010 (0-0.031)	2.36 (0.28-7.84)	11985 (<1.8-9200)	219 (102-339)	0.45 (0.16-0.93)	0.038 (0.004-0.105)	133 (62-211)	85 (32-124)	14.56 (3.86-29.98)	25.4 (9.07-56.09)	0.55 (0.22-1.20)
Hirakud Reservoir																
6.	Hirakud reservoir	23 (1-75)	71 (44-98)	8.2 (4.8-13.8)	0.266 (BDL-1.120)	0.010 (0-0.029)	2.19 (0.56-7.28)	853 (<1.8-9200)	193 (135-298)	0.34 (0.28-0.43)	0.025 (<0.003-0.084)	109 (82-124)	71 (52-82)	10.37 (7.71-13.99)	13.99 (6.72-18.65)	0.35 (0.25-0.54)
Power Channel																
7.	Power Channel U/s	27 (1-132)	74 (48-96)	8.4 (4.8-13.9)	0.083 (BDL-0.330)	0.003 (0-0.013)	2.12 (0.56-5.60)	161 (<1.8-790)	177 (132-227)	0.35 (0.24-0.68)	0.032 (<0.003-0.088)	107 (86-121)	70 (56-86)	9.50 (7.40-11.99)	12.63 (6.72-17.16)	0.36 (0.27-0.55)
8.	Power Channel D/s	23 (2-88)	73 (48-96)	17.0 (6.6-93.5)	0.200 (0.056-1.120)	0.004 (0-0.014)	1.96 (0.56-6.16)	330 (<1.8-1300)	185 (153-227)	0.35 (0.24-0.68)	0.034 (<0.003-0.112)	113 (94-132)	73 (54-94)	10.20 (7.40-15.99)	13.74 (6.84-21.76)	0.37 (0.28-0.55)
Mahanadi river																
9.	Sambalpur U/s	23 (1-115)	80 (52-112)	10.2 (7.7-17.8)	0.168 (0.056-1.120)	0.003 (0-0.014)	1.84 (0.28-4.48)	468 (20-1700)	203 (135-261)	0.42 (0.29-0.53)	0.045 (<0.003-0.095)	120 (88-148)	77 (60-100)	11.26 (1.99-15.99)	14.07 (9.95-21.26)	0.38 (0.27-0.56)
10.	Sambalpur D/s	23 (2-86)	83 (56-116)	15.4 (6.6-28.1)	0.219 (BDL-1.680)	0.006 (0-0.021)	3.10 (0.28-7.84)	2928 (20-11000)	215 (137-290)	0.45 (0.28-0.75)	0.051 (<0.003-0.123)	127 (96-164)	81 (56-106)	13.16 (7.40-18.20)	16.67 (9.95-28.07)	0.38 (0.24-0.58)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
11.	Sambalpur FD/s at Shankar-math	29 (1-70)	89 (64-110)	11.8 (6.4-19.8)	0.102 (BDL-0.336)	0.003 (0-0.014)	3.62 (0.56-15.12)	1453 (20-9200)	221 (161-273)	0.42 (0.26-0.62)	0.095 (0.003-0.666)	129 (102-158)	82 (64-102)	13.55 (7.40-19.99)	13.58 (8.20-19.40)	0.41 (0.22-0.45)
12.	Sambalpur FFD/s at Huma	38 (1-84)	80 (56-104)	9.3 (4.8-15.8)	0.112 (BDL-0.448)	0.003 (0-0.007)	2.99 (0.56-16.80)	1079 (45-5400)	194 (146-266)	0.39 (0.26-0.79)	0.028 (<0.003-0.059)	118 (98-147)	76 (52-98)	10.79 (7.40-14.99)	14.20 (5.84-24.50)	0.39 (0.28-0.61)
13.	Sonepur U/s	18 (1-59)	84 (60-112)	8.8 (4.8-17.8)	0.125 (BDL-0.336)	0.005 (0-0.018)	2.43 (0.56-10.08)	33 (<1.8-110)	208 (146-262)	0.41 (0.26-0.76)	0.042 (<0.003-0.144)	123 (88-148)	80 (54-104)	12.22 (7.40-17.99)	12.80 (7.41-20.02)	0.39 (0.25-0.61)
14.	Sonepur D/s	20 (1-66)	86 (64-104)	11.3 (7.6-16.8)	0.164 (BDL-0.560)	0.004 (0-0.010)	2.99 (0.56-14.56)	210 (20-1300)	236 (192-263)	0.51 (0.35-0.83)	0.038 (<0.003-0.088)	135 (119-156)	86 (64-102)	16.35 (11.57-24.98)	13.53 (8.58-18.36)	0.41 (0.24-0.60)
15.	Tikarapada	58 (4-247)	77 (56-98)	8.2 (3.6-13.9)	0.219 (0.056-0.560)	0.012 (0-0.056)	3.01 (0.56-6.72)	375 (20-2200)	195 (161-252)	0.40 (0.26-0.55)	0.041 (0.007-0.122)	113 (88-138)	73 (42-92)	11.43 (7.40-15.99)	11.48 (2.24-18.40)	0.39 (0.22-0.72)
16.	Narasingh-pur	40 (4-198)	82 (60-102)	9.0 (5.7-18.7)	0.079 (BDL-0.220)	0.005 (0-0.017)	1.96 (0.56-4.48)	288 (<1.8-1300)	195 (154-234)	0.46 (0.21-1.96)	0.172 (<0.003-1.510)	125 (98-228)	79 (62-104)	15.11 (7.71-65.96)	12.41 (7.83-18.40)	0.34 (0.24-0.50)
17.	Munduli	38 (5-144)	78 (56-98)	8.2 (3.8-11.8)	0.089 (BDL-0.336)	0.004 (0-0.009)	2.10 (0.56-5.04)	225 (20-490)	194 (153-228)	0.36 (0.23-0.53)	0.039 (<0.003-0.133)	115 (96-142)	77 (62-92)	10.55 (6.99-15.70)	11.27 (5.22-18.53)	0.34 (0.24-0.46)
18.	Cuttack U/s	27 (2-106)	77 (56-100)	7.9 (3.9-11.8)	0.084 (BDL-0.224)	0.004 (0-0.007)	1.90 (0.17-5.04)	374 (20-1300)	186 (145-221)	0.34 (0.18-0.55)	0.053 (<0.003-0.123)	110 (92-129)	74 (52-86)	10.02 (5.99-13.00)	11.84 (5.34-18.40)	0.34 (0.25-0.54)
19.	Cuttack D/s	42 (2-111)	82 (56-96)	13.4 (9.5-19.7)	0.172 (0.056-0.448)	0.008 (0.001-0.021)	2.42 (0.28-21.72)	2667 (68-16000)	201 (148-240)	0.40 (0.26-0.75)	0.048 (0.003-0.143)	119 (92-147)	78 (62-88)	12.07 (7.71-22.98)	11.93 (4.60-18.28)	0.34 (0.25-0.55)
20.	Cuttack FD/s	33 (1-120)	84 (56-112)	11.6 (8.3-19.7)	0.121 (0.056-0.330)	0.007 (0.001-0.026)	3.29 (0.28-7.84)	2348 (45-16000)	195 (147-248)	0.36 (0.26-0.51)	0.047 (<0.003-0.137)	116 (92-142)	78 (52-90)	10.68 (7.70-14.99)	11.72 (4.97-18.15)	0.36 (0.26-0.68)
21.	Paradeep U/s	105 (14-182)	105 (68-166)	10.7 (3.2-21.0)	0.178 (0.056-0.570)	0.003 (0-0.009)	2.78 (0.56-6.16)	356 (<1.8-1300)	10929 (161-31070)	24.67 (0.35-59.40)	0.710 (0.007-2.570)	7819 (106-22060)	1150 (62-2900)	4114.7 (9.64-11994.0)	591.6 (5.97-1424.2)	0.47 (0.24-0.72)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
22.	Paradeep D/s	242 (48-904)	104 (48-134)	20.5 (8.5-45.3)	0.177 (BDL-0.560)	0.005 (0-0.018)	2.87 (0.56-8.96)	47 (<1.8-230)	24314 (203-51284)	49.50 (0.56-97.60)	1.316 (0.017-2.781)	19687 (122-43260)	2421 (52-5400)	10660.1 (19.28-23488.2)	1273.7 18.65-2898.1)	0.77 (0.21-2.60)
Ong River																
23.	Dharuakhaman	24 (2-91)	120 (70-156)	9.6 (3.3-16.8)	0.130 (0.056-0.448)	0.006 (0.001-0.021)	2.84 (0.56-9.52)	351 (<1.8-3500)	280 (141-397)	0.46 (0.24-0.82)	0.028 (<0.003-0.077)	161 (89-223)	109 (60-152)	16.44 (6.99-24.98)	12.59 (7.58-36.94)	0.50 (0.23-0.73)
Tel River																
24.	Monmunda	52 (16-126)	77 (52-96)	8.6 (3.3-17.8)	0.224 (0.056-0.672)	0.005 (0-0.011)	2.47 (0.28-8.96)	141 (<1.8-700)	178 (148-206)	0.33 (0.20-0.66)	0.024 (<0.003-0.077)	104 (88-122)	72 (52-84)	9.66 (5.78-16.70)	5.66 (1.74-12.11)	0.32 (0.21-0.46)
Kathajodi River																
25.	Cuttack U/s	60 (3-136)	83 (56-96)	8.6 (6.4-11.8)	0.173 (0.056-0.560)	0-0.005)	1.68 (0.56-4.48)	857 (45-3500)	193 (140-220)	0.39 (0.26-0.56)	0.050 (0.004-0.164)	116 (88-138)	74 (56-82)	11.25 (7.40-18.99)	10.47 (1.24-19.27)	0.32 (0.27-0.45)
26.	Cuttack D/s	40 (6-191)	94 (60-128)	21.0 (10.0-29.7)	0.158 (0.056-0.386)	0.005 (0-0.018)	2.33 (0.28-7.84)	28411 (330-92000)	240 (155-384)	0.53 (0.32-0.94)	0.052 (<0.003-0.116)	143 (98-213)	89 (64-118)	18.04 (9.30-35.98)	13.92 (1.37-24.87)	0.32 (0.25-0.43)
27.	Mattagajpur (Cuttack FD/s)	31 (1-108)	95 (56-120)	17.8 (8.4-26.6)	0.298 (0.056-0.900)	0.010 (0-0.032)	3.98 (1.12-12.32)	12436 (330-54000)	279 (152-357)	0.70 (0.36-0.99)	0.058 (<0.003-0.108)	165 (96-228)	94 (58-122)	24.37 (9.64-39.98)	20.91 (11.19-29.97)	0.28 (0.21-0.48)
28.	Kamasasan (Cuttack FFD/s)	42 (2-200)	88 (60-124)	10.0 (6.2-15.8)	0.155 (0.056-0.450)	0.005 (0-0.014)	2.80 (0.56-7.28)	526 (20-1700)	219 (144-313)	0.51 (0.31-0.74)	0.051 (0.004-0.226)	131 (89-179)	80 (54-106)	15.33 (7.71-25.98)	11.37 (6.34-20.64)	0.32 (0.24-0.48)
Serua River																
29.	Sankhatrasa	62 (3-462)	91 (58-124)	17.2 (8.2-29.7)	0.247 (0.056-0.790)	0. 006(0.001-0.024)	3.43 (0.28-10.64)	13206 (78-92000)	223 (139-335)	0.48 (0.29-0.96)	0.043 (<0.003-0.115)	133 (88-192)	84 (56-106)	15.51 (7.71-33.98)	11.57 (6.09-21.14)	0.32 (0.24-0.44)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
Kuakhai River																
30.	Bhubaneswar FU/s	23 (2-86)	83 (64-100)	9.0 (3.9-13.9)	0.181 (BDL-0.670)	0.005 (0-0.020)	4.11 (1.12-11.20)	670 (130-1700)	200 (146-221)	0.40 (0.29-0.53)	0.047 (<0.003-0.112)	117 (92-138)	74 (62-86)	11.62 (9.64-15.80)	11.71 (6.59-26.36)	0.32 (0.19-0.54)
31.	Bhubaneswar U/s	33 (2-192)	87 (60-108)	9.8 (3.9-12.4)	0.190 (0.056-0.670)	0.008 (0-0.054)	3.27 (0.56-8.96)	1351 (490-2400)	210 (146-245)	0.44 (0.33-0.65)	0.062 (<0.003-0.214)	125 (94-148)	80 (64-98)	12.98 (11.10-21.98)	12.63 (6.21-29.35)	0.29 (0.20-0.44)
Daya River																
32.	Gelapur	25 (3-142)	81 (56-102)	8.1 (3.8-13.9)	0.224 (0.056-0.952)	0.005 (0-0.021)	2.99 (0.56-9.52)	1778 (45-16000)	201 (145-224)	0.52 (0.30-1.52)	0.052 (<0.003-0.143)	126 (82-197)	77 (56-86)	15.39 (7.71-45.97)	12.69 (7.83-28.35)	0.29 (0.17-0.47)
33.	Bhubaneswar D/s	47 (2-332)	85 (48-108)	31.4 (13.3-56.2)	0.494 (0.110-2.800)	0.006 (0-0.029)	4.06 (0.56-10.64)	55575 (4900-160000)	312 (163-384)	1.09 (0.61-1.57)	0.080 (0.010-0.217)	179 (104-220)	88 (60-100)	37.99 (17.35-63.00)	18.67 (8.58-33.96)	0.27 (0.17-0.42)
34.	Bhubaneswar FD/s	53 (2-390)	83 (60-120)	28.0 (6.6-49.8)	0.158 (0.056-0.330)	0.003 (0-0.021)	3.71 (0.56-8.96)	35592 (1300-160000)	288 (161-390)	0.91 (0.55-1.58)	0.053 (0.003-0.143)	164 (106-214)	84 (62-100)	31.80 (15.42-55.97)	16.28 (7.33-33.08)	0.27 (0.17-0.41)
35.	Kanas	75 (14-156)	89 (58-114)	18.7 (6.1-46.5)	0.186 (0.056-0.560)	0.007 (0-0.034)	2.16 (0.28-3.92)	3618 (20-16000)	274 (167-356)	0.93 (0.45-1.80)	0.051 (0.021-0.221)	166 (96-218)	85 (60-100)	31.64 (13.50-55.97)	15.50 (8.19-20.97)	0.27 (0.11-0.55)
Gangua River																
36.	Near Rajdhani Engg. College	51 (7-118)	86 (50-148)	55.8 (28.5-118.8)	1.049 (0.056-3.920)	0.004 (0-0.039)	5.55 (2.52-12.32)	145500 (54000-160000)	317 (211-419)	1.31 (0.73-1.78)	0.064 (<0.003-0.161)	173 (122-234)	73 (50-110)	38.27 (8.45-28.10)	12.72 (8.45-28.10)	0.23 (0.13-0.40)
37.	Palasuni	64 (2-140)	85 (54-124)	56.4 (26.6-96.4)	1.105 (0.056-4.500)	0.010 (0-0.067)	5.71 (0.56-16.80)	151167 (54000-160000)	330 (204-416)	1.34 (0.80-2.08)	0.060 (<0.003-0.190)	185 (128-246)	79 (62-100)	43.11 (22.20-77.12)	16.77 (8.58-27.48)	0.28 (0.13-0.56)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
38.	Samantrapur	121 (2-888)	96 (62-128)	80.7 (29.9-216.7)	1.023 (0.056-3.808)	0.009 (0-0.088)	5.60 (1.12-14.00)	151167 (54000-160000)	397 (273-718)	1.60 (0.91-3.02)	0.042 (<0.003-0.088)	225 (152-398)	90 (54-126)	55.22 (25.90-131.93)	27.42 (10.07-95.32)	0.24 (0.14-0.40)
39.	Vadimula	48 (5-97)	92 (52-136)	43.2 (14.9-111.8)	0.479 (0.056-1.340)	0.011 (0-0.073)	4.67 (0.56-13.44)	121942 (4900-160000)	386 (187-510)	1.48 (0.74-2.33)	0.051 (0.003-0.102)	223 (114-279)	95 (46-116)	52.26 (24.10-86.76)	21.69 (5.72-43.03)	0.29 (0.15-0.52)
Birupa River																
40.	Choudwar D/s	36 (3-121)	81 (54-98)	9.0 (5.9-16.4)	0.236 (BDL-0.790)	0.008 (0-0.040)	3.69 (1.12-10.64)	963 (0-3500)	209 (161-273)	0.52 (0.25-1.53)	0.047 (<0.003-0.087)	123 (94-160)	75 (56-84)	15.17 (7.40-48.20)	12.46 (6.59-21.89)	0.35 (0.25-0.48)
Kushabhadra River																
41.	Bhingarpur	42 (2-132)	110 (60-150)	13.9 (5.6-20.1)	0.479 (0.056-1.340)	0.006 (0-0.014)	1.84 (0.56-3.92)	1758 (20-5400)	284 (189-410)	0.62 (0.39-1.06)	0.053 (0.004-0.254)	163 (108-222)	97 (64-130)	21.31 (11.57-35.98)	12.01 (5.72-19.27)	0.29 (0.13-0.50)
42.	Nimapara	59 (12-248)	90 (56-128)	14.0 (7.3-25.6)	0.135 (0.056-0.560)	0.004 (0-0.018)	2.05 (0.56-5.04)	2388 (20-16000)	279 (152-789)	0.82 (0.38-3.75)	0.051 (0.003-0.242)	159 (96-429)	83 (54-126)	29.50 (11.57-157.90)	14.69 (10.32-28.60)	0.25 (0.15-0.42)
43.	Gop	58 (3-100)	91 (60-112)	13.2 (7.3-20.6)	0.182 (0.056-0.560)	0.013 (0-0.087)	1.93 (0.28-5.04)	3508 (330-16000)	249 (183-334)	0.68 (0.37-1.11)	0.057 (0.003-0.294)	146 (106-194)	84 (56-104)	22.29 (13.00-41.97)	13.87 (10.32-17.66)	0.28 (0.16-0.54)
Bhargavi River																
44.	Chandanpur	32 (6-100)	85 (56-112)	11.1 (7.6-15.8)	0.219 (0.056-0.560)	0.015 (0.001-0.055)	2.62 (0.28-9.28)	1257 (110-5400)	256 (160-506)	0.70 (0.23-3.22)	0.056 (<0.003-0.118)	146 (94-274)	83 (60-100)	22.09 (5.78-101.90)	17.34 (8.58-27.24)	0.40 (0.23-0.60)
Mangala River																
45.	Malatipatpur	39 (4-246)	91 (56-126)	10.3 (7.6-15.8)	0.214 (BDL-0.780)	0.005 (0-0.023)	2.66 (0.56-11.20)	1307 (270-5400)	270 (164-522)	0.63 (0.22-1.24)	0.040 (0.007-0.098)	159 (98-278)	94 (54-142)	22.32 (6.99-49.97)	23.44 (11.07-61.55)	0.34 (0.18-0.44)
46.	Golasahi	106 (30-192)	134 (56-240)	29.5 (9.7-61.2)	0.434 (0.056-1.680)	0.019 (0.001-0.113)	3.70 (0.56-12.04)	5323 (1300-17000)	10391 (169-32040)	26.28 (0.58-74.87)	0.282 (0.003-1.351)	8240 (102-32900)	1197 (52-4200)	4323.6 (15.42-17991.0)	590.25 (16.66-1791.10)	0.41 (0.21-0.70)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
Devi River																
47.	Machhagaon	125 (14-278)	110 (58-216)	27.6 (8.2-66.7)	0.265 (0.056-0.560)	0.006 (0.001-0.013)	3.55 (0.56-11.20)	400 (<1.8-2400)	12773 (168-39970)	38.99 (0.64-161.72)	0.617 (0.003-2.141)	10429 (108-33060)	1245 (64-4500)	5562.3 (19.28-17991.0)	688.0 (10.32-2307.2)	0.47 (0.24-0.80)
Gobari River																
48.	Kendrapara U/s	74 (22-178)	122 (48-228)	11.5 (5.0-18.7)	0.157 (0.056-0.450)	0.011 (0-0.056)	2.22 (0.56-8.40)	5668 (110-28000)	881 (164-1999)	5.75 (0.55-31.83)	0.103 (0.004-0.484)	729 (104-3340)	154 (60-272)	323 (17.35-1869.0)	46.89 (8.33-160.46)	0.39 (0.21-0.74)
49.	Kendrapara D/s	64 (25-204)	120 (48-202)	13.9 (7.6-21.8)	0.233 (0.056-0.560)	0.008 (0-0.041)	3.55 (0.56-8.96)	12524 (490-54000)	934 (164-1971)	6.24 (0.60-34.98)	0.089 (0.004-0.386)	803 (102-3580)	163 (56-260)	354.17 (15.42-1999.0)	66.32 (8.20-208.30)	0.39 (0.20-0.66)
Nuna River																
50.	Bijipur	71 (7-196)	87 (48-144)	14.7 (7.6-31.5)	0.167 (0.056-0.560)	0.005 (0-0.055)	1.77 (0.28-3.36)	3043 (220-16000)	233 (143-375)	0.51 (0.28-1.45)	0.052 (0.003-0.266)	136 (88-208)	84 (50-132)	16.59 (9.30-49.97)	15.65 (6.84-25.49)	0.32 (0.21-0.50)
Kusumi River																
51.	Tangi	64 (6-366)	68 (44-92)	13.0 (6.8-37.1)	0.264 (0.056-1.120)	0.010 (0.001-0.056)	3.66 (0.56-12.88)	3517 (68-16000)	185 (127-314)	0.58 (0.33-0.88)	0.042 (<0.003-0.143)	111 (82-169)	64 (40-92)	16.09 (9.64-30.23)	10.31 (2.86-24.50)	0.31 (0.11-0.52)
Kansari River																
52.	Banapur	53 (3-232)	100 (68-202)	14.0 (9.1-27.4)	0.173 (0.056-0.560)	0.010 (0-0.036)	1.80 (0.56-5.04)	4563 (130-16000)	272 (141-560)	0.63 (0.20-2.29)	0.051 (0.003-0.161)	163 (85-375)	94 (56-164)	23.41 (7.99-94.95)	17.51 (1.37-87.19)	0.31 (0.13-0.45)
Badasankha River																
53.	Langaleswar	32 (6-90)	147 (40-196)	17.4 (6.6-25.7)	0.302 (0.056-0.896)	0.012 (0.001-0.041)	2.83 (8.96)	1801 (78-5400)	1112 (144-7583)	4.01 (0.53-27.04)	0.113 (0.003-0.365)	745 (109-5490)	189 (56-800)	327.05 (13.00-2998.5)	40.74 (2.61-248.70)	0.39 (0.20-0.56)
Sabulia River																
54.	Rambha	50 (2-144)	191 (78-284)	14.0 (6.6-229)	0.303 (0.056-0.780)	0.016 (0.006-0.070)	3.06 (0.56-13.44)	2713 (78-16000)	500 (187-730)	1.16 (0.16-1.78)	0.065 (0.003-0.329)	293 (102-420)	166 (72-252)	49.48 (5.99-83.95)	20.01 (9.10-59.70)	0.46 (0.28-0.63)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(µS/cm)		(mg/l)					
Ratnachira River																
55.	Kumardihi	35 (3-84)	90 (36-164)	15.3 (6.1-30.9)	0.167 (0.056-0.336)	0.008 (0.001-0.035)	2.89 (0.56-8.96)	3469 (110-16000)	282 (121-605)	0.68 (0.32-1.80)	0.056 (0.003-0.123)	153 (82-346)	88 (40-164)	24.79 (10.99-89.99)	16.01 (2.98-34.70)	0.39 (0.20-0.58)
❖ Class 'C'		-	-	-	-	-	-	-		-	-	1500	-	600	400	1.5
❖ Class 'E'									2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

(A) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Ib River												
1.	Sundargarh	2.1242 (0.565-4.305)	0.076 (0.009-0.356)	<0.002	0.005	4.814	0.002	0.004	0.008	0.0003	0.00006	0.002
2.	Jharsuguda	2.571 (0.199-7.284)	0.077 (0.001-0.180)	0.005	0.014	3.631	0.006	0.007	0.015	0.0003	0.00019	0.013
3.	Brajraj nagar U/s	2.063 (0.266-4.244)	0.054 (0.001-0.155)	<0.002	0.012	3.254	0.008	0.006	0.009	0.0008	0.00006	0.007
4.	Brajraj nagar D/s	2.142 (0.372-6.922)	0.093 (0.002-0.344)	<0.002	0.019	5.539	0.014	0.012	0.015	0.0009	0.00025	0.016
Bheden river												
5.	Jharsuguda	3.277 (0.274-10.720)	0.058 (0.003-0.151	0.005	0.021	0.296	0.011	0.004	0.016	0.0006	<0.00006	0.015
Hirakud reservoir												
6.	Hirakud reservoir	2.486 (0.754-6.245)	0.068 (0.001-0.171	<0.002	0.009	0.357	0.006	0.003	0.006	0.0004	0.00019	0.004

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
7.	Power channel U/s	2.094 (0.429-5.134)	0.094 (0.001-0.457)	<0.002	0.011	0.153	0.006	0.003	0.006	0.0005	0.00013	0.006
8.	Power Channel D/s	2.568 (0.988-5.160)	0.146 (0.003-0.590)	0.003	0.019	0.541	0.008	0.005	0.014	0.0005	0.00019	0.008
Mahanadi River												
9.	Sambalpur U/s	2.968 (0.775-5.397)	0.065 (0.002-0.199)	<0.002	0.009	0.587	0.006	0.002	0.004	0.0004	0.00051	0.004
10.	Sambalpur D/s	3.099 (1.032-5.764)	0.113 (0.002-0.753)	0.003	0.011	0.571	0.008	0.004	0.020	0.0004	0.00044	0.005
11.	Sambalpur FD/s at Shankarmath	2.706 (0.927-5.043)	0.116 (0.001-0.725)	<0.002	0.009	0.643	0.007	0.004	0.007	0.0003	0.00019	0.009
12.	Sambalpur FD/s at Huma	2.831 (1.085-7.272)	0.095 (0.001-0.332)	<0.002	0.011	0.602	0.005	0.004	0.035	0.0003	0.00051	0.004
13.	Sonepur U/s	2.135 (0.870-5.125)	0.080 (0.001-0.270)	<0.002	0.005	0.469	0.005	0.004	0.006	0.0004	0.00006	0.007
14.	Sonepur D/s	2.443 (1.156-5.746)	0.114 (0.001-0.516)	0.002	0.005	0.367	0.006	0.002	0.003	0.0004	<0.00006	0.003
15.	Tikarapada	1.700 (0.286-3.289)	0.096 (0.001-0.508)	<0.002	0.009	0.877	0.006	0.003	0.003	0.0004	0.00006	0.003
16.	Narasinghpur	1.598 (0.420-3.503)	0.143 (0.003-0.895)	0.01	0.021	0.959	0.001	0.001	0.002	0.0004	0.00006	0.002
17.	Munduli	1.935 (0.207-5.248)	0.154 (0.001-1.008)	0.002	0.014	0.974	0.002	0.001	0.003	0.0005	0.00051	0.005
18.	Cuttack U/s	1.783 (0.464-4.942)	0.158 (0.007-0.601)	<0.002	0.008	0.128	0.002	0.001	0.004	0.0004	0.00025	0.006
19.	Cuttack D/s	3.905 (0.297-30.035)	0.098 (0.001-0.335)	0.005	0.011	0.944	0.008	0.001	0.004	0.0003	<0.00006	0.005
20.	Cuttack FD/s	1.767 (0.332-6.080)	0.101 (0.001-0.669)	0.015	0.029	0.275	0.008	0.001	0.007	0.0004	0.00021	0.008
21.	Paradeep U/s	2.527 (0.511-6.096)	0.085 (0.002-0.322)	0.003	0.011	1.872	0.006	0.004	0.007	0.0004	0.00006	0.008
22.	Paradeep D/s	2.341 (0.315-5.886)0	0.577 (0.017-3.600)	0.008	0.026	0.551	0.008	0.006	0.012	0.0006	0.00013	0.008

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Ong River												
23.	Dharuakhaman	2.636 (0.815-11.327)	0.126 (0.001-0.621)	<0.002	0.005	0.464	0.005	0.005	0.026	0.0009	0.00025	0.010
Tel River												
24.	Monmunda	1.856 (0.857-3.375)	0.142 (0.001-0.602)	0.003	0.011	0.785	0.005	0.007	0.057	0.0007	0.00019	0.008
Kathajodi River												
25.	Cuttack U/s	1.977 (0.164-6.430)	0.146 (0.005-0.549)	<0.002	0.005	1.637	0.001	0.004	0.002	0.0004	0.00044	0.003
26.	Cuttack D/s	6.356 (0.426-20.911)	0.274 (0.004-0.833)	0.015	0.037	0.296	0.003	0.001	0.005	0.0003	0.00025	0.005
27.	Mattagajpur (Cuttack FD/s)	4.419 (0.626-8.744)	0.226 (0.001-1.082)	<0.002	0.009	1.821	0.005	0.004	0.004	0.0008	0.00063	0.012
28.	Kamasasan (Cuttack FFD/s)	6.091 (0.651-16.574)	0.160 (0.004-0.412)	0.005	0.011	1.499	0.002	0.003	0.002	0.0005	<0.00006	0.005
Serua River												
29.	Sankhatrasa (Cuttack FD/s)	3.515 (0.549-7.923)	0.243 (0.004-0.723)	<0.002	0.009	3.397	0.003	0.003	0.032	0.0006	0.00006	0.010
Kuakhai River												
30.	Bhubaneswar FU/s	1.903 (0.328-4.050)	0.083 (0.001-0.332)	0.005	0.011	0.505	0.006	0.002	0.007	0.0004	0.00057	0.005
31.	Bhubaneswar U/s	1.896 (0.195-6.183)	0.111 (0.001-0.457)	0.007	0.017	0.954	0.004	0.002	0.010	0.0004	0.00006	0.005
Daya River												
32.	Gelapur	1.982 (1.041-3.581)	0.139 (0.002-0.479)	0.012	0.029	1.341	0.007	0.003	0.009	0.0006	0.00006	0.002
33.	Bhubaneswar D/s	13.826 (3.848-41.624)	0.302 (0.015-0.708)	0.02	0.031	1.295	0.004	0.002	0.012	0.0011	0.00076	0.004
34.	Bhubaneswar FD/s	18.700 (1.887-51.994)	0.226 (0.009-0.476)	0.012	0.026	0.785	0.005	0.002	0.006	0.0011	0.00006	0.003
35.	Kanas	7.232 (1.032-20.765)	0.128 (0.001-0.378)	<0.002	0.009	4.304	0.007	0.008	0.037	0.0008	0.00285	0.006

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Gangua River												
36.	Near Rajdhani Engg. College	11.198 (1.487-35.855)	0.358 (0.106-1.186)	0.018	0.037	2.366	0.006	0.004	0.025	0.0012	0.00006	0.002
37.	Palasuni	15.297 (0.805-43.076)	0.402 (0.002-1.290)	0.017	0.024	0.938	0.004	0.004	0.046	0.0016	0.00032	0.006
38.	Samantraypur	16.899 (0.726-56.826)	0.485 (0.145-1.359)	0.018	0.03	0.903	0.009	0.010	0.109	0.0008	0.00006	0.006
39.	Vadimula	23.670 (1.448-62.178)	0.578 (0.022-1.604)	0.005	0.015	3.468	0.003	0.008	0.045	0.0008	0.00006	0.006
Birupa River												
40.	Choudwar D/s	2.003 (0.079-7.172)	0.130 (0.001-0.904)	<0.002	0.01	0.219	0.014	0.003	0.007	0.0004	0.00019	0.005
Kushabhadra River												
41.	Bhingarpur	3.420 (0.784-8.237)	0.064 (0.002-0.161)	0.003	0.015	1.703	0.009	0.004	0.036	0.0007	0.00019	0.006
42.	Nimapara	2.326 (0.985-3.980)	0.091 (0.001-0.196)	<0.002	0.013	0.755	0.011	0.004	0.012	0.0008	0.00013	0.008
43.	Gop	2.005 (0.833-4.079)	0.109 (0.005-0.256)	<0.002	0.013	4.712	0.012	0.006	0.098	0.0007	0.00044	0.008
Bhargavi River												
44.	Chandanpur	1.821 (0.035-4.154)	0.270 (0.002-2.120)	<0.002	0.01	1.372	0.006	0.005	0.009	0.0011	0.00013	0.005
Mangala River												
45.	Malatipatpur	2.973 (0.140-6.463)	0.136 (0.001-0.830)	<0.002	0.011	0.551	0.005	0.003	0.007	0.0007	0.00013	0.006
46.	Golasahi	11.334 (2.615-36.796)	0.275 (0.019-0.629)	<0.002	0.015	1.183	0.007	0.008	0.011	0.0009	0.00032	0.007
Devi River												
47.	Machhagaon	2.548 (0.638-6.368)	0.317 (0.002-3.001)	0.012	0.025	0.780	0.008	0.007	0.008	0.0004	0.00006	0.005

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Gobari River												
48.	Kendrapara U/s	3.640 (0.134-9.936)	0.109 (0.006-0.319)	0.010	0.027	0.520	0.016	0.003	0.006	0.0011	0.00032	0.014
49.	Kendrapara D/s	4.220 (0.912-9.048)	0.119 (0.003-0.290)	0.010	0.045	0.887	0.008	0.003	0.008	0.0012	0.00019	0.012
Nuna River												
50.	Bijipur	2.144 (0.928-4.894)	0.072 (0.001-0.166)	0.005	0.011	1.811	0.008	0.007	0.029	0.0009	0.00032	0.005
Kusumi River												
51.	Tangi	3.374 (1.398-8.633)	0.101 (0.001-0.366)	0.015	0.027	0.842	0.006	0.006	0.007	0.0007	<0.00006	0.002
Kansari River												
52.	Banapur	3.679 (1.155-7.015)	3.679 (1.155-7.015)	<0.002	0.021	1.336	0.004	0.009	0.027	0.0006	<0.00006	0.008
Badasankha River												
53.	Langaleswar	5.736 (0.450-31.164)	0.072 (0.001-0.237)	0.002	0.023	0.796	0.006	0.002	0.006	0.0009	0.00013	0.008
Sabulia River												
54.	Rambha	5.400 (0.523-12.586)	0.081 (0.001-0.198)	0.003	0.018	1.836	0.007	0.002	0.040	0.0007	0.00019	0.004
Ratnachira River												
55.	Kumardihi	2.940 (0.070-11.383)	0.100 (0.001-0.345)	<0.002	0.013	6.293	0.009	0.003	0.018	0.0004	<0.00006	0.005
***Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'**		-	-	-	-	-	-	-	-	-	-	-

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

* **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Data for the period April, 2018

(B) **Brahmani River System (2018)**

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Sankh river																
1.	Sankh U/s	70 (2-330)	58 (32-78)	9.4 (5.5-14.4)	0.190 (BDL-0.670)	0.006 (0-0.028)	4.22 (0.28-11.20)	3101 (130-16000)	148 (111-201)	0.39 (0.21-0.59)	0.015 (<0.003-0.045)	87 (68-112)	52 (30-72)	9.32 (5.99-15.99)	9.20 (2.61-26.36)	0.33 (0.13-0.53)
Koel river																
2.	Koel U/s	138 (11-722)	78 (36-110)	9.7 (5.0-17.8)	0.368 (BDL-2.800)	0.037 (0-0.208)	4.32 (0.56-21.28)	2619 (20-16000)	185 (136-251)	0.34 (0.22-0.51)	0.021 (<0.003-0.077)	111 (83-146)	74 (48-104)	9.61 (5.86-13.00)	11.67 (2.73-28.10)	0.28 (0.14-0.50)
Brahmani river																
3.	Panposh U/s	122 (14-376)	70 (44-98)	10.6 (5.0-19.8)	0.167 (BDL-0.670)	0.011 (0-0.068)	4.44 (0.28-11.20)	1889 (170-9200)	169 (133-224)	0.36 (0.25-0.45)	0.038 (<0.003-0.077)	100 (78-138)	65 (46-100)	9.57 (5.80-13.50)	10.08 (2.86-26.24)	0.33 (0.19-0.62)
4.	Panposh D/s	167 (14-836)	72 (36-104)	32.8 (15.8-48.0)	1.091 (BDL-10.752)	0.027 (0-0.242)	5.04 (0.56-16.80)	19333 (1700-49000)	322 (207-494)	0.67 (0.16-1.11)	0.046 (0.004-0.091)	182 (122-258)	100 (64-120)	22.30 (5.99-31.98)	47.28 (26.36-80.40)	1.03 (0.24-1.60)
5.	Rourkela D/s	229 (8-634)	70 (40-88)	29.1 (13.8-44.2)	0.302 (0.056-1.456)	0.007 (0-0.029)	4.55 (0.28-20.16)	8874 (490-35000)	227 (150-308)	0.49 (0.19-0.87)	0.042 (<0.003-0.084)	132 (84-175)	77(44-96)	15.36 (5.99-31.98)	23.49 (8.95-33.45)	0.51 (0.21-0.75)
6.	Rourkela FD/s (Attaghat)	164 (8-812)	79 (46-140)	22.2 (11.2-40.3)	0.271 (0.056-0.800)	0.006 (0-0.026)	5.01 (0.28-17.92)	3617 (20-13000)	225 (152-313)	0.46 (0.16-0.64)	0.029 (<0.003-0.073)	133 (86-184)	81 (48-118)	14.79 (5.78-19.99)	20.95 (11.43-39.05)	0.49 (0.23-0.79)
7.	Rourkela FD/s (Biritola)	131 (9-662)	76 (42-126)	13.5 (5.0-28.8)	0.163 (0.056-0.450)	0.005 (0-0.036)	3.66 (0.56-11.76)	1238 (20-5400)	202 (141-273)	0.40 (0.21-0.81	0.027 (<0.003-0.087)	121 (82-143)	76 (48-100)	11.13 (5.78-15.99)	18.50 (7.83-32.09)	0.41 (0.21-0.84)
8.	Bonaigarh	155 (6-696)	71 (32-92)	11.1 (6.7-17.3)	0.218 (0.056-0.720)	0.009 (0-0.058)	2.26 (0.28-7.28)	481 (5-1700)	200 (111-245)	0.41 (0.14-0.55)	0.024 (<0.003-0.101	118 (64-142)	72 (40-88)	12.20 (3.86-17.99)	18.33 (10.32-27.36)	0.41 (0.20-0.62)
9.	Rengali	38 (1-158)	53 (28-78)	7.7 (3.6-12.9)	0.107 (0.056-0.220)	0.004 (0-0.014)	1.82 (0.28-3.92)	188 (20-540)	139 (111-199)	0.30 (0.19-0.52)	0.061 (0.004-0.407)	84 (66-110)	54 (38-84)	7.12 (5.78-12.99)	11.92 (5.84-23.75)	0.35 (0.17-0.63)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
10.	Samal	38 (1-132)	55 (32-70)	8.4 (3.6-13.8)	0.117 (BDL-0.450)	0.006 (0-0.029)	2.10 (0.56-6.72)	457 (45-1300)	145 (102-187)	0.31 (0.19-0.50)	0.048 (<0.003-0.143)	87 (62-103)	55 (36-80)	7.27 (5.86-9.99)	14.15 (8.08-27.24)	0.38 (0.19-0.72)
11.	Talcher FU/s	38 (1-178)	53 (40-72)	7.6 (3.6-11.9)	0.149 (BDL-0.560)	0.004 (0-0.011)	1.96 (0.56-5.60)	504 (20-1700)	141 (121-173)	0.29 (0.23-0.38)	0.056 (0.004-0.157)	87 (76-106)	54 (44-60)	7.01 (5.78-8.22)	13.90 (5.97-29.60)	0.36 (0.18-0.72)
12.	Talcher U/s	61 (4-385)	60 (44-88)	9.2 (3.6-13.9)	0.121 (BDL-0.330)	0.004 (0-0.009)	1.75 (0.56-4.48)	774 (45-3500)	165 (117-286)	0.34 (0.33-0.52)	0.040 (0.004-0.084)	98 (84-164)	60 (46-104)	8.89 (5.78-17.30)	16.14 (6.46-36.69)	0.36 (0.17-0.97)
13.	Mandapal	52 (1-166)	61 (32-146)	10.5 (5.5-23.6)	0.079 (BDL-0.224)	0.002 (0-0.004)	2.75 (0.28-8.96)	2010 (78-16000)	172 (119-519)	0.31 (0.21-0.68)	0.042 (0.004-0.084)	105 (74-314)	66 (42-192)	9.35 (5.78-35.98)	20.91 (8.58-79.97)	0.53 (0.11-2.60)
14.	Talcher D/s	35 (2-102)	62 (48-84)	13.7 (7.6-28.8)	0.145 (BDL-0.570)	0.004 (0-0.029)	2.64 (0.28-7.28)	1352 (20-4600)	170 (124-249)	0.45 (0.28-1.55)	0.068 (0.004-0.133)	104 (82-148)	61 (52-90)	11.48 (7.40-37.98)	16.08(9.33-29.97)	0.40 (0.20-0.84)
15.	Talcher FD/s	64 (1-334)	67 (36-100)	11.3 (3.6-17.7)	0.084 (BDL-0.336)	0.002 (0-0.005)	1.89 (0.28-7.28)	819 (78-3500)	181 (126-266)	0.48 (0.29-1.36)	0.086 (0.004-0.217)	112 (78-149)	63 (48-86)	12.95 (7.99-43.97)	16.74 (8.45-28.85)	0.39 (0.24-0.51)
16.	Dhenkanal U/s	49 (3-192)	56 (44-72)	8.7 (3.8-13.1)	0.167 (0.056-0.560)	0.005 (0.001-0.011)	2.17 (0.28-5.04)	619 (45-3500)	153 (115-201)	0.36 (0.24-0.50)	0.037 (<0.003-0.098)	92 (78-119)	54 (42-66)	9.14 (6.99-12.99)	13.94 (7.08-26.74)	0.36 (0.18-0.63)
17.	Dhenkanal D/s	36 (3-154)	66 (48-80)	9.8 (5.5-12.9)	0.191 (0.056-0.670)	0.004 (0.001-0.015)	2.62 (0.03-6.72)	1844 (78-11000)	173 (116-224)	0.39 (0.28-0.57)	0.054 (<0.003-0.147)	105 (85-122)	63 (52-74)	10.46 (5.99-13.99)	15.63 (7.21-27.48)	0.36 (0.21-0.55)
18.	Bhuban	39 (4-180)	56 (40-80)	9.3 (3.8-14.4)	0.131 (BDL-0.620)	0.007 (0-0.060)	2.15 (0.56-11.20)	255 (<1.8-1300)	149 (106-186)	0.31 (0.17-0.46)	0.059 (0.004-0.249)	90 (68-104)	55 (40-70)	7.68 (3.86-10.60)	14.33 (7.46-25.62)	0.34 (0.18-0.54)
19.	Kabatabandha	63 (3-264)	55 (44-66)	6.8 (3.6-11.2)	0.224 (0.056-0.560)	0.005 (0-0.018)	2.52 (0.28-10.64)	555 (<1.8-2800)	155 (114-171)	0.34 (0.20-0.53)	0.036 (<0.003-0.108)	91 (82-98)	55 (48-68)	8.39 (5.78-10.99)	15.01 (9.10-22.51)	0.34 (0.24-0.46)
20.	Dharmasala U/s	52 (1-214)	68 (44-96)	6.7 (4.0-10.9)	0.229 (0.056-0.560)	0.007 (0-0.034)	2.36 (0.28-11.20)	543 (45-1300)	173 (115-225)	0.40 (0.23-0.90)	0.040 (<0.003-0.101)	104 (68-135)	62 (40-84)	11.66 (5.78-25.98)	12.24 (5.59-17.16)	0.27 (0.19-0.44)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
21.	Dharmasala D/s	74 (6-244)	68 (44-96)	9.2 (3.6-16.5)	0.205 (0.056-0.670)	0.008 (0-0.028)	3.00 (0.56-13.40)	840 (<1.8-2800))	182 (139-230)	0.41 (0.19-0.77)	0.036 (0.003-0.133)	109 (82-138)	66 (48-88)	12.38 (5.78-22.98)	14.16 (6.09-19.77)	0.26 (0.18-0.34)
22.	Pottamundai	55 (18-154)	76 (40-100)	9.9 (3.8-13.1)	0.182 (0.056-0.560)	0.004 (0-0.014)	2.59 (0.56-5.04)	898 (45-3500)	217 (130-343)	0.50 (0.26-0.66)	0.040 (0.003-0.108)	124 (78-158)	76 (50-92)	15.70 (7.71-21.98)	13.95 (9.45-24.50)	0.37 (0.25-0.69)
Nandira River																
23.	Nandira U/s	161 (2-758)	151 (64-212)	11.6 (4.1-18.7)	0.121 (BDL-0.560)	0.006 (0-0.022)	2.99 (0.28-10.64)	2998 (20-16000)	488 (175-607)	0.77 (0.35-1.28)	0.076 (0.007-0.133)	278 (97-356)	169 (60-220)	33.55 (9.99-61.96)	54.71 (13.68-89.18)	1.03 (0.26-2.00)
24.	Nandira D/s	177 (1-780)	149 (92-192)	14.1 (6.1-27.7)	0.267 (BDL-0.6680)	0.016 (0-0.054)	3.76 (0.56-15.12)	4947 (110-17000)	513 (295-594)	0.87 (0.63-1.45)	0.092 (<0.003-0.187	306 (182-378)	182 (104-208)	36.54 (22.42-58.00)	71.81 (35.07-104.60)	1.41 (0.54-2.70)
Kisinda Jhor																
25.	Kisindajhor	25 (1-64)	148 (104-208)	12.1 (3.8-29.7)	0.126 (BDL-0.560)	0.007 (0.-0.45)	1.96 (0.56-3.92)	962 (20-3500)	533 (393-669)	1.03 (0.43-1.78)	0.113 (0.004-0.252)	309 (206-418)	177 (142-214)	42.35 (19.28-58.60)	67.39 (35.94-123.90)	1.61 (0.53-3.50)
Kharasrota River																
26.	Khanditara	69 (4-244)	60 (44-78)	6.9 (3.4-11.8)	0.158 (0.056-0.560)	0.005 (0-0.012)	1.59 (0.56-3.36)	386 (<1.8-2800)	156 (118-188)	0.33 (0.21-0.46)	0.027 (<0.003-0.074)	94 (68-114)	57 (40-74)	8.33 (5.50-11.99)	14.56 (6.46-22.88)	0.30 (0.25-0.36)
27.	Binjharpur	88 (5-330)	65 (40-84)	7.8 (3.4-16.5)	0.144 (BDL-0.336)	0.008 (0.001-0.021)	1.94 (0.56-3.92)	562 (<1.8-3500)	163 (123-194)	0.36 (0.29-0.46)	0.038 (<0.003-0.094)	101 (76-117)	61 (40-76)	9.37 (6.93-11.10)	14.67 (6.09-26.74)	0.27 (0.19-0.37)
28.	Aul	54 (24-142)	70 (48-88)	10.4 (3.8-16.8)	0.196 (0.056-0.560)	0.005 (0-0.017)	2.57 (0.56-6.16)	1006 (20-2400)	757 (133-6052)	2.00 (0.21-18.19)	0.151 (0.004-0.775)	428 (78-3390)	140 (52-634)	163.02 (5.99-1730.0)	59.53 (7.21-305.8)	0.40 (0.21-0.84)
29.	Guradih nallah	84 (28-276)	78 (38-132)	46.0 (27.4-63.4)	1.892 (0.056-10.416)	0.008 (0-0.022)	11.60 (0.28-50.96)	54050 (4600-160000)	429 (303-574)	0.88 (0.58-1.50)	0.070 (<0.003-0.116)	245 (168-322)	129 (104-160)	32.46 (20.98-43.97)	72.97 (40.54-103.70)	1.46 (0.19-2.20)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Badjhor nallah																
30.	Badjhor nallah	21 (6-37)	108 (62-138)	9.9 (5.7-17.8)	0.144 (BDL-0.336)	0.020 (0-0.191)	3.61 (0.56-7.28)	5737 (130-54000)	286 (158-407)	0.64 (0.19-1.14)	0.060 (0.004-0.242)	170 (93-234)	103 (66-130)	24.08 (5.99-42.97)	16.95 (9.70-29.10)	0.45 (0.29-0.72)
Damsala River																
31.	Dayanabil	62 (13-274)	89 (40-130)	7.0 (3.4-11.2)	0.191 (BDL-1.230)	0.005 (0-0.013)	3.01 (0.56-11.20)	812 (<1.8-2800)	224 (124-315)	0.27 (0.20-0.36)	0.038 (<0.003-0.108)	132 (72-219)	98 (44-168)	9.25 (5.78-11.99)	19.62 (3.48-60.25)	0.24 (0.14-0.40)
Ganda nallah																
32.	Marthapur	90 (8-326)	68 (46-104)	11.2 (5.5-16.1)	0.131 (BDL-0.330)	0.004 (0-0.009)	2.40 (0.56-6.16)	4952 (<1.8-35000)	190 (121-391)	0.40 (0.25-0.99)	0.052 (<0.003-0.130)	113 (78-238)	68 (44-128)	12.41 (6.70-40.97)	18.50 (7.09-51.49)	0.41 (0.23-1.20)
Lingira River																
33.	Angul U/s	18 (1-40)	131 (76-196)	9.8 (8.1-12.7)	0.158 (BDL-0.780)	0.028 (0.002-0.111)	3.94 (0.28-17.64)	1719 (<1.8-16000)	359 (244-526)	0.53 (0.22-0.67)	0.066 (0.007-0.252)	201 (146-306)	133 (84-172)	20.34 (9.64-29.98)	20.03 (9.15-31.35)	0.67 (0.50-0.95)
34.	Angul D/s	15 (1-92)	163 (88-214)	11.3 (8.2-14.4)	0.263 (0.056-0.890)	0.006 (0.002-0.012)	5.30 (0.56-23.80)	803 (<1.8-2800)	445 (375-502)	0.74 (0.44-1.14)	0.062 (0.004-0.175)	247 (206-282)	161 (120-200)	31.97 (21.21-51.97)	24.78 (9.53-36.56)	0.67 (0.59-0.79)
Ramiala River																
35.	Kamakhyanagar	49 (1-312)	69 (36-168)	9.7 (3.8-17.8)	0.149 (0.056-0.448)	0.011 (0.001-0.034)	1.94 (0.28-6.16)	621 (78-2400)	178 (124-427)	0.40 (0.20-0.86)	0.069 (<0.003-0.235)	107 (75-243)	66 (42-152)	12.60 (5.99-39.98)	11.69 (3.10-25.99)	0.36 (0.18-0.70)
Banguru nallah																
36.	Banguru nallah	47 (1-156)	134 (100-184)	10.5 (5.5-19.8)	0.154 (0.056-0.450)	0.012 (0.001-0.036)	3.78 (0.28-13.72)	492 (45-1400)	733 (442-988)	0.55 (0.32-0.93)	0.049 (<0.001-0.168)	421 (246-546)	286 (160-372)	29.84 (17.99-43.77)	177.04 (81.59-278.60)	0.61 (0.49-0.80)
Singada jhor																
37.	Singada jhor	99 (4-496)	126 (64-168)	10.5 (5.5-18.7)	0.200 (0.056-0.560)	0.009 (0.002-0.036)	3.36 (0.28-11.48)	486 (20-2800)	398 (164-510)	0.49 (0.27-0.88)	0.045 (0.003-0.182)	237 (98-324	161 (62-212)	19.52 (9.64-26.98)	60.04 (17.93-101.90)	0.66 (0.38-1.80)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Tikira River																
38.	Kaniha U/s	216 (2-648)	77 (62-88)	9.1 (5.5-16.8)	0.158 (0.056-0.448)	0.010 (0-0.035)	2.85 (0.28-14.28)	449 (20-1700)	215 (157-326)	0.40 (0.27-0.58)	0.051 (<0.003-0.221)	128 (88-188)	82 (62-126)	11.57 (7.40-17.99)	21.53 (7.46-50.12)	0.59 (0.22-1.50)
39.	Kaniha D/s	95 (8-486)	86 (64-108)	11.0 (5.5-18.7)	0.228 (0.056-0.896)	0.005 (0-0.017)	2.38 (0.28-7.56)	1045 (20-3500)	292 (210-427)	0.55 (0.29-1.35)	0.061 (0.003-0.196)	173 (122-239)	108 (78-170)	19.33 (9.30-39.40)	40.15 (23.88-68.65)	1.18 (0.37-2.90)
Bangurusingada jhor																
40.	Bangurusingada jhor	32 (2-158)	140 (52-194)	10.2 (5.0-19.3)	0.181 (0.056-0.504)	0.012 (0.004-0.040)	3.27 (0.56-6.72)	1024 (<1.8-2800)	353 (170-484)	0.49 (0.26-0.98)	0.060 (0.004-0.235)	200 (96-268)	138 (60-172)	19.16 (7.71-46.97)	23.13 (12.68-38.80)	0.64 (0.38-0.97)
Karo River																
41.	Barbil	98 (1-798)	68 (36-88)	9.5 (3.8-16.1)	0.150 (0.056-0.450)	0.016 (0-0.076)	2.03 (0.28-6.16)	652 (45-1700)	157 (104-198)	0.26 (0.15-0.53)	0.033 (0.003-0.123)	94 (62-119)	65 (32-88)	7.73 (5.78-10.99)	7.64 (2.98-13.80)	0.25 (0.09-0.75)
❖ **Class 'C'**		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ **Class 'E'**			-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**
Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

(b) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Sankha River												
1.	Sankha U/s	2.239 (0.243-6.595)	0.058 (0.002-0.201)	<0.002	0.018	0.949	0.001	0.002	0.003	0.0006	<0.00006	0.003
Koel River												
2.	Koel U/s	3.078 (0.371-7.570)	0.054 (0.002-0.205)	0.003	0.027	6.926	0.004	0.005	0.004	0.0008	<0.00006	0.009
Brahmani river												
3.	Panposh U/s	3.166 (0.304-5.886)	0.090 (0.006-0.376)	<0.002	0.013	2.642	0.005	0.004	0.092	0.0007	0.00006	0.005
4.	Panposh D/s	20.965 (4.198-48.980)	0.126 (0.001-0.369)	<0.002	0.018	4.274	0.004	0.006	0.221	0.0012	0.00032	0.014
5.	Rourkela D/s	11.660 (2.811-33.027)	0.138 (0.001-0.811)	<0.002	0.021	6.181	0.007	0.008	0.240	0.0018	0.00013	0.018
6.	Attaghat	8.969 (0.910-19.146)	0.091 (0.001-0.249)	<0.002	0.015	4.014	0.004	0.019	0.025	0.0008	0.00006	0.010
7.	Biritola	4.630 (1.143-12.761)	0.063 (0.001-0.270)	<0.002	0.013	0.709	0.002	0.003	0.004	0.0006	0.00006	0.006
8.	Bonai	7.867 (3.052-16.085)	0.064 (0.001-0.223)	<0.002	0.018	6.605	0.004	0.005	0.015	0.0009	<0.00006	0.010
9.	Rengali	2.557 (0.166-4.650)	0.140 (0.001-0.787)	<0.002	0.018	1.142	0.005	0.007	0.015	0.0004	<0.00006	0.010
10.	Samal	2.352 (0.219-5.239)	0.111 (0.001-0.279)	<0.002	0.015	1.290	0.005	0.003	0.005	0.0004	<0.00006	0.003
11.	Talcher FU/s	1.780 (0.421-3.227)	0.104 (0.001-0.419)	<0.002	0.019	0.311	0.007	0.003	0.003	0.0004	<0.00006	0.003
12.	Talcher U/s	2.251 (0.699-4.732)	0.099 (0.001-0.506)	<0.002	0.02	0.439	0.007	0.001	0.004	0.0004	<0.00006	0.002

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
13.	Mandapal	2.211 (1.064-3.665)	0.076 (0.001-0.156)	<0.002	0.015	0.179	0.008	0.003	0.003	0.0004	<0.00006	0.005
14.	Talcher D/s	2.187 (1.312-4.601)	0.101 (0.001-0.565)	<0.002	0.022	1.224	0.011	0.003	0.005	0.0007	<0.00006	0.003
15.	Talcher FD/s	2.070 (0.742-3.962)	0.044 (0.001-0.123)	<0.002	0.015	2.438	0.011	0.002	0.002	0.0007	<0.00006	0.001
16.	Dhenkanal U/s	2.527 (0.912-10.598)	0.106 (0.001-0.456)	<0.002	0.015	0.066	0.001	0.002	0.005	0.0004	<0.00006	0.005
17.	Dhenkanal D/s	0.418 (0.322-3.665)	0.112 (0.001-0.680)	<0.002	0.018	0.036	0.002	0.004	0.012	0.0005	<0.00006	0.007
18.	Bhuban	1.874 (0.669-3.061)	0.145 (0.001-1.279)	0.002	0.018	0.535	0.006	0.002	0.009	0.0004	0.00013	0.003
19.	Kabatabandha	3.106 (0.523-8.710)	0.072 (0.001-0.221)	<0.002	0.027	2.341	0.006	0.005	0.006	0.0004	0.00057	0.007
20.	Dharmasala U/s	2.305 (0.525-6.776)	0.094 (0.002-0.284)	<0.002	0.024	0.831	0.006	0.005	0.003	0.0006	0.00038	0.011
21.	Dharmasala D/s	2.271 (0.401-6.377)	0.151 (0.003-0.586)	<0.002	0.024	2.530	0.006	0.012	0.003	0.0006	0.00070	0.012
22.	Pottamundai	3.788 (0.918-14.039)	0.112 (0.011-0.355)	0.005	0.037	0.479	0.006	0.002	0.009	0.0007	0.00019	0.007
Nandira River												
23.	Nandira U/s	5.570 (1.174-11.580)	0.235 (0.001-1.574)	<0.002	0.027	4.213	0.014	0.015	0.029	0.0006	0.00019	0.021
24.	Nandira D/s	4.045 (1.557-8.867)	0.174 (0.001-0.824)	<0.002	0.029	5.243	0.016	0.004	0.009	0.0009	0.00032	0.007

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Kisindajhor												
25.	Kisindajhor	11.282 (2.184-28.784)	0.101 (0.002-0.277)	<0.002	0.024	0.026	0.009	0.004	0.009	0.0006	0.00013	0.008
Kharasrota River												
26.	Khanditara	2.422 (0.675-4.575)	0.172 (0.001-0.870)	<0.002	0.027	2.417	0.005	0.001	0.008	0.0004	0.00076	0.005
27.	Binjharpur	1.918 (0.140-4.077)	0.074 (0.002-0.179)	<0.002	0.024	3.478	0.005	0.002	0.011	0.0007	0.00044	0.008
28.	Aul	3.544 (1.131-11.195)	0.364 (0.002-3.198)	0.013	0.035	1.040	0.004	0.008	0.015	0.0011	0.00006	0.008
Guradih nallah												
29.	Guradih nallah	24.770 (5.930-55.566)	0.070 (0.002-0.193)	0.003	0.029	3.662	0.006	0.009	0.192	0.0012	0.00019	0.016
Badjhor nallah												
30.	Badjhor nallah	2.965 (0.630-8.362)	0.171 (0.001-1.389)	0.01	0.024	0.156	0.007	0.004	0.003	0.0005	<0.00006	0.007
Damsala River												
31.	Dayanabil	3.730 (0.182-13.950)	0.081 (0.002-0.211)	0.022	0.059	3.295	0.004	0.004	0.008	0.0004	0.00032	0.002
Ganda nallah												
32.	Marthapur	3.655 (0.237-9.632)	0.131 (0.011-0.690)	0.002	0.015	1.005	0.004	0.009	0.017	0.0006	0.00019	0.003
Lingra River												
33.	Angul U/s	1.952 (0.444-5.095)	0.126 (0.001-0.910)	<0.002	0.017	0.102	0.001	0.003	0.003	0.0004	<0.00006	0.002

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
34.	Angul D/s	2.172 (0.604-4.364)	0.082 (0.003-0.301)	<0.002	0.024	0.046	0.003	0.003	0.007	0.0011	<0.00006	0.004
Ramiala River												
35.	Kamakhyanagar	1.369 (0.055-2.545)	0.104 (0.001-0.429)	0.002	0.02	0.015	0.006	0.004	0.005	0.0004	0.00013	0.001
Banguru nallah												
36.	Banguru nallah	2.875 (0.620-6.269)	0.173(0.001-1.194)	<0.002	0.018	2.433	0.007	0.005	0.007	0.0004	<0.00006	0.018
Singada jhor												
37.	Singada jhor	2.457 (0.523-6.244)	0.087 (0.005-0.189)	<0.002	0.029	6.472	0.006	0.008	0.015	0.0004	<0.00006	0.017
Tikira River												
38.	Kaniha U/s	1.990 (0.067-4.877)	0.159 (0.001-0.836)	<0.002	0.04	4.672	0.007	0.007	0.011	0.0007	0.00013	0.007
39.	Kaniha D/s	2.409 (0.195-5.198)	0.127 (0.006-0.346)	<0.002	0.027	1.688	0.008	0.002	0.004	0.0070	0.00013	0.002
Bangurusingada jhor												
40.	Bangurusingada jhor	1.538 (0.079-5.335)	0.120 (0.001-0.664)	<0.002	0.024	0.551	0.007	0.001	0.003	0.0006	0.00006	0.001

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Karo River												
41.	Barbil	2.305 (0.540-5.108)	0.062 (0.001-0.300)	0.01	0.03	0.316	0.017	0.002	0.002	0.0006	0.00063	0.006
❖	**Class 'C'**	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖	**Class 'E'**	-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(C) Baitarani river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Kundra Nallah																
1.	Joda	54 (1-167)	63 (34-84)	10.0 (5.5-19.3)	0.093 (BDL-0.224)	0.003 (0-0.007)	1.50 (0.28-4.76)	654 (18-2200)	156 (121-195)	0.31 (0.19-0.68)	0.033 (<0.003-0.157)	92 (72-110)	59 (34-76)	8.22 (5.78-9.99)	9.20 (3.60-20.64)	0.23 (0.11-0.46)
Kusei River																
2.	Deogaon	104 (13-381)	112 (32-166)	9.6 (5.1-20.6)	0.177 (0.056-0.450)	0.008 (0-0.023)	3.21 (1.08-10.64)	1438 (110-2800)	256 (97-346)	0.39 (0.13-0.71)	0.038 (<0.003-0.081)	145 (56-204)	103 (24-172)	13.37 (5.78-19.99)	9.76 (3.21-14.05)	0.30 (0.15-0.68)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Baitarani River																
3.	Naigarh	207 (2-1806)	48 (16-164)	10.5 (5.0-41.1)	0.178 (0.056-0.560)	0.006 (0-0.036)	1.71 (0.06-5.06)	279 (20-1100)	124 (65-315)	0.28 (0.14-0.54)	0.015 (<0.003-0.042)	74 (42-172)	48 (24-152)	6.01 (3.80-9.30)	8.82 (1.74-25.00)	0.35 (0.07-1.42)
4.	Unchabali	204 (1-1852)	38 (22-52)	11.3 (5.0-44.9)	0.093 (BDL-0.336)	0.003 (0-0.010)	1.98 (0.56-5.04)	371 (4.5-2200)	103 (76-155)	0.28 ()0.10-0.50)	0.023 (0.003-0.049)	62 (48-91)	38 (28-50)	5.53 (3.86-7.99)	7.68 (1.99-15.50)	0.23 (0.09-0.50)
5.	Champua	65 (1-346)	53 (32-72)	9.4 (1.9-23.8)	0.112 (0.056-0.560)	0.002 (0-0.005)	1.98 (0.28-6.44)	485 (20-1700)	133 (108-168)	0.32 (0.17-0.49)	0.019 (0.004-0.052)	81 (64-97)	50 (40-62)	7.50 (3.80-11.99)	8.88 (4.47-17.53)	0.19 (0.07-0.37)
6.	Tribindha	60 (1-218)	55 (32-68)	8.1 (3.8-15.0)	0.154 (0.056-0.560)	0.004 (0-0.011)	1.70 (0.56-4.48)	501 (20-1700)	145 (99-213)	0.35 (0.18-0.78)	0.019 (<0.003-0.088)	87 (58-132)	53 (28-66)	8.57 (4.99-23.98)	10.90 (2.74-19.90)	0.21 (0.10-0.37)
7.	Joda	85 (1-664)	51 (24-72)	8.2 (3.4-13.1)	0.135 (0.056-0.560)	0.007 (0-0.059)	1.82 (0.56-5.04)	442 (20-1700)	129 (97-167)	0.26 (0.16-0.43)	0.019 (<0.003-0.067)	77 (56-98)	50 (36-58)	6.92 (3.86-11.99)	8.88 (4.35-16.79)	0.20 (0.11-0.37)
8.	Anandpur	56 (14-176)	60 (38-80)	9.3 (5.0-18.7)	0.167 (BDL-0.448)	0.004 (0-0.012)	2.17 (1.12-5.04)	848 (78-2400)	160 (126-204)	0.37 (0.24-0.70)	0.029 (<0.003-0.084)	92 (68-119)	55 (40-72)	9.79 (6.70-18.11)	8.52 (3.10-13.55)	0.20 (0.08-0.40)
9.	Jajpur	121 (2-458)	67 (40-96)	8.6 (3.6-15.8)	0.219 (0.056-0.560)	0.010 (0.002-0.044)	2.45 (0.56-5.88)	2676 (20-16000)	173 (118-233)	0.38 (0.12-0.60)	0.096 (<0.003-0.685)	102 (74-136)	63 (40-84)	10.02 (3.86-14.10)	11.65 (1.74-20.27)	0.26 (0.15-0.68)
10.	Chandbali U/s	328 (44-906)	90 (44-180)	19.0 (6.8-47.6)	0.173 (0.056-0.570)	0.009 0.001-0.071)	2.01 (0.56-4.48)	5338 (330-16000)	6155 (145-19730)	17.38 (0.57-46.89)	0.511 (<0.003-2.148)	4211 (88-14400)	634 (44-2000)	2167.2 (13.5-7696.2)	327.03 (12.31-982.60)	0.32 (0.18-0.57)
11.	Chandbali D/s	366 (80-940)	89 (48-130)	21.9 (8.5-50.2)	0.117 (BDL-0.336)	0.004 (0-0.012)	1.74 (0.45-3.92)	6023 (330-16000)	6161 (189-19770)	17.16 (0.89-45.21)	0.615 (0.003-2.396)	4435 (122-14800)	717 (52-2220)	2262.1 (21.2-7896.1)	393.96 (13.80-1113.20)	0.33 (0.10-0.82)
Salandi River																
12.	Bhadrak U/s	41 (7-82)	80 (40-128)	8.7 (3.4-14.4)	0.107 (BDL-0.336)	0.005 (0-0.014)	1.42 (0.56-2.80)	1188 (170-5400)	182 (99-249)	0.37 (0.17-0.65)	0.090 (0.003-0.277)	107 (48-142)	71 (36-102)	10.34 (5.99-13.99)	7.44 (2.86-16.42)	0.25 (0.13-0.60)
13.	Bhadrak D/s	44 (20-68)	81 (32-120)	16.9 (6.7-42.6)	0.148 (BDL-0.448)	0.009 (0-0.041)	2.03 (0.56-4.48)	5338 (130-35000)	202 (97-273)	0.41 (0.21-0.76)	0.126 (0.004-0.723)	114 (58-159)	75 (38-100)	12.53 (7.71-18.99)	9.19 (3.60-20.23)	0.24 (0.12-0.42)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Dhamra River																
14.	Dhamra	526 (62-2076)	100 (50-148)	25.1 (12.4-57.2)	0.214 (0.056-0.448)	0.006 (0-0.017)	2.56 (0.17-9.52)	3125 (130-16000)	17827 (284-45150)	41.01 (1.02-82.27)	1.265 (0.017-2.898)	14117 (178-34290)	1832 (92-4550)	7681.3 (30.9-19490.2)	871.3 (52.9-2223.3)	0.42 (0.14-0.63)
❖	**Class 'C'**	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	**Class 'E'**	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

(C) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Kundra nallah												
1.	Joda	3.089 (0.328-9.984)	0.058 (0.002-0.277)	0.005	0.015	1.499	0.001	0.002	0.009	0.0003	<0.00006	0.004
Kusei River												
2.	Deogaon	1.744 (0.438-4.531)	0.125 (0.001-0.464)	<0.002	0.024	1.158	0.001	0.001	0.008	0.0004	<0.00006	0.004
Baitarani river												
3.	Naigarh	2.328 (0.815-5.829)	0.110 (0.001-0.961)	0.008	0.024	1.076	0.018	0.003	0.006	0.0004	0.00032	0.002

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
4.	Unchabali	2.578 (1.058-4.793)	0.064 (0.001-0.398)	0.003	0.027	1.290	0.016	0.001	0.007	0.0004	0.00044	0.002
5.	Champua	2.483 (0.365-4.122)	0.112 (0.001-0.811)	<0.002	0.015	0.163	0.002	0.001	0.009	0.0006	<0.00006	0.007
6.	Tribindha	3.247 (0.341-7.452)	0.105 (0.001-0.522)	0.003	0.018	0.770	0.001	0.002	0.009	0.0002	<0.00006	0.001
7.	Joda	2.319 (0.833-4.290)	0.058 (0.002-0.487)	<0.002	0.015	0.444	0.001	0.002	0.011	0.0004	0.00032	0.003
8.	Anandpur	2.303 (0.347-5.613)	0.077 (0.001-0.467)	<0.002	0.013	0.031	0.002	0.001	0.026	0.0006	<0.00006	0.006
9.	Jajpur	2.349 (0.055-6.001)	0.070 (0.002-0.190)	0.002	0.015	1.127	0.008	0.002	0.003	0.0005	0.00044	0.004
10.	Chandbali U/s	2.455 (0.961-7.190)	0.112 (0.001-0.456)	<0.002	0.018	4.631	0.011	0.012	0.066	0.0007	0.00076	0.012
11.	Chandbali D/s	2.639 (0.464-6.945)	0.163 (0.001-0.916)	<0.002	0.024	4.814	0.016	0.017	0.076	0.0009	0.00032	0.012
Salandi river												
12.	Bhadrak U/s	1.736 (0.450-6.709)	0.080 (0.001-0.345)	<0.002	0.013	0.530	0.007	0.003	0.005	0.0004	<0.00006	0.004
13.	Bhadrak D/s	2.372 (0.035-8.545)	0.098 (0.001-0.309)	<0.002	0.018	0.842	0.009	0.019	0.004	0.0006	0.00013	0.012
Dhamra River												
14.	Dhamra	2.385 (0.026-6.988)	0.074 (0.001-0.198)	<0.002	0.015	7.711	0.011	0.007	0.041	0.0009	0.00044	0.005
❖ **Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖ **Class 'E'**		-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(D) Rushikulya river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
Russelkunda Reservoir																
1.	Russelkunda	24 (6-62)	74 (60-84)	11.2 (7.9-17.1)	0.247 (BDL-0.670)	0.011 (0-0.055)	2.80 (0.56-5.60)	781 (<1.8-2800)	166 (145-185)	0.39 (0.24-0.74)	0.037 (0.003-0.074)	96 (81-112)	62 (52-76)	9.84 (7.40-14.90)	3.26 (0.87-7.71)	0.28 (0.18-0.46)
Bada Nadi																
2	Aska	63 (16-208)	118 (100-140)	10.2 (5.5-21.1)	0.125 (BDL-0.330)	0.009 (0-0.041)	4.57 (0.56-13.40)	696 (45-2800)	300 (238-554)	0.78 (0.38-3.11)	0.045 (<0.003-0.101)	176 (146-352)	105 (84-120)	30.31 (11.10-138.90)	7.27 (1.49-10.82)	0.29 (0.22-0.45)
Rushikulya river																
3.	Aska	46 (2-104)	132 (104-164)	9.7 (5.5-15.0)	0.382 (BDL-1.608)	0.028 (0-0.168)	4.83 (0.28-16.24)	1307 (45-2700)	284 (222-342)	0.44 (0.31-0.71)	0.035 (0.003-0.077)	163 (132-198)	114 (78-138)	15.72 (11.10-25.06)	4.97 (2.24-8.83)	0.29 (0.22-0.44)
4.	Nalabanta	75 (22-186)	122 (94-148)	10.0 (5.9-16.8)	0.209 (BDL-0.670)	0.018 (0-0.084)	4.20 (1.12-12.32)	1038 (<1.8-3500)	317 (247-498)	0.63 (0.33-2.02)	0.065 (0.004-0.334)	174 (139-298)	111 (84-132)	25.45 (11.1-96.10)	7.16 (2.11-14.55)	0.29 (0.23-0.48)
5.	Madhopur	95 (1-220)	132 (112-162)	10.2 (3.8-17.8)	0.126 (BDL-0.450)	0.007 (0-0.036)	1.82 (0.28-3.36)	1220 (<1.8-3500)	506 (260-2005)	1.57 (0.44-8.21)	0.066 (0.011-0.270)	296 (144-1170)	133 (96-264)	80.27 (14.80-499.70)	23.80 (3.11-143.03)	0.33 (0.24-0.58)
6.	Potagarh	164 (21-302)	138 (116-186)	29.5 (5.2-49.3)	0.195 (BDL-0.560)	0.009 (0-0.027)	3.97 (0.28-21.00)	435 (<1.8 -1700)	14248 (436-34020)	29.09 (1.48-58.59)	0.491 (0.010-1.450)	11104 (242-26900)	1774 (116-4000)	5859.7 (57.84-14492.7)	839.1 (19.28-2070.9)	0.41 (0.27-0.63)
❖ **Class 'C'**		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ **Class 'E'**		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

(D) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Russelkunda Reservoir												
1.	Russelkunda	1.827 (0.420-4.463)	0.037 (0.001-0.122)	0.003	0.018	0.643	0.015	0.005	0.056	0.0006	0.00178	0.003
Bada Nadi												
2.	Aska	1.868 (0.638-3.437)	0.058 (0.001-0.273)	0.002	0.024	1.239	0.012	0.008	0.014	0.0007	0.00051	0.006
Rushikulya river												
3.	Aska	2.346 (1.005-6.214)	0.083 (0.002-0.444)	0.013	0.044	0.326	0.011	0.004	0.009	0.0007	0.00076	0.007
4.	Nalabanta	1.846 (0.438-4.958)	0.083 (0.001-0.178)	0.003	0.024	2.203	0.011	0.003	0.019	0.0004	0.00044	0.011
5.	Madhopur	5.063 (0.146-34.102)	0.108 (0.003-0.448)	0.007	0.027	5.681	0.015	0.013	0.014	0.0006	<0.00006	0.008
6.	Potagarh	3.433 (0.490-7.171)	0.065 (0.001-0.234)	0.022	0.044	2.820	0.009	0.006	0.018	0.0009	0.00006	0.009
❖ **Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖ **Class 'E'**		-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(E) Nagavali river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Nagavali river																
1.	Penta	129 (18-440)	84 (66-98)	8.8 (3.6-17.8)	0.105 (BDL-0.330)	0.006 (0-0.021)	3.94 (0.56-11.76)	573 (<1.8-2400)	191 (154-228)	0.28 (0.12-0.40)	0.017 (0.003-0.064)	111 (88-124)	75 (56-84)	8.10 (3.99-9.99)	11.46 (3.48-16.04)	0.31 (0.20-0.48)
2.	Jaykaypur D/s	201 (10-1470)	96 (68-120)	17.0 (9.1-29.7)	0.163 (BDL-0.560)	0.013 (0-0.063)	3.90 (0.28-8.40)	1185 (170-3500)	243 (171-346)	0.47 (0.25-0.83)	0.041 (<0.003-0.112)	144 (98-189)	90 (58-124)	15.54 (7.71-27.98)	17.13 (8.33-25.37)	0.28 (0.18-0.41)
3.	Rayagada D/s	201 (22-1422)	109 (72-150)	13.5 (7.4-22.7)	0.143 (BDL-0.392)	0.007 (0-0.041)	3.10 (0.56-7.84)	543 (45-1700)	295 (184-435)	0.55 (0.28-0.97)	0.058 (0.003-0.225)	168 (110-244)	106 (76-150)	19.95 (9.64-39.98)	18.77 (11.14-32.31)	0.28 (0.18-0.44)
❖	Class 'C'	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	Class 'E'	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**
Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

(E) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Nagavali river												
1.	Penta	5.206 (1.041-29.229)	0.153 (0.006-0.624)	<0.002	0.015	1.193	0.004	0.002	0.009	0.0003	0.00032	0.003
2.	Jaykaypur D/s	3.135 (1.514-5.632)	0.154 (0.001-0.627)	<0.002	0.027	4.355	0.006	0.005	0.035	0.0005	0.00070	0.007
3.	Rayagada D/s	4.127 (1.113-12.341)	0.131 (0.029-0.346)	<0.002	0.019	5.498	0.006	0.005	0.011	0.0005	0.00089	0.005
❖ **Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖ **Class 'E'**		-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Data for the period April, 2018

(F) Subarnarekha river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Subarnarekha river																
1.	Rajghat	99 (25-394)	90 (48-116)	10.8 (5.5-21.8)	0.168 (BDL-0.900)	0.010 (0-0.059)	2.49 (0.28-10.08)	765 (78-1700)	285 (147-388)	0.69 (0.34-0.99)	0.139 (0.007-0.884)	164 (92-212)	95 (56-124)	24.21 (9.64-35.98)	24.83 (11.19-35.60)	0.44 (0.13-0.70)
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

(F) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Subarnarekha river												
1.	Rajghat	2.622 (0.105-6.088)	0.089 (0.001-0.273)	0.002	0.015	1.158	0.006	0.009	0.005	0.0004	0.00057	0.014
❖ Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(G) Budhabalanga river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/ cm)		(mg/l)					
Budhabalanga river																
1.	Baripada D/s	61 (8-228)	87 (46-122)	10.8 (7.3-15.8)	0.167 (BDL-0.560)	0.006 (0-0.018	2.75 (0.56-8.24)	4478 (200-35000)	217 (132-305)	0.44 (0.29-0.55)	0.075 (0.003-0.459)	129 (74-176)	84 (40-116)	13.94 (7.71-21.98)	13.46 (7.96-21.85)	0.27 (0.14-0.46)
2.	Balasore U/s	102 (7-260)	82 (52-120)	10.0 (5.5-17.1)	0.121 (BDL-0.560)	0.005 (0-0.014)	1.62 (0.56-3.36)	1663 (330-5400)	197 (118-279)	0.44 (0.22-0.56)	0.076 (0.003-0.445)	119 (78-168)	76 (52-108)	13.06 (6.78-17.99)	11.86 (6.96-16.29)	0.25 (0.13-0.42)
3.	Balasore D/s	95 (28-138)	91 (70-130)	15.8 (7.3-23.8)	0.242 (BDL-0.780)	0.011 (0-0.041)	3.64 (1.12-10.08)	12900 (1700-54000)	287 (184-569)	0.87 (0.36-2.28)	0.083 (0.007-0.382)	166 (113-323)	87 (64-120)	30.64 (10.99-93.95)	15.52 (7.83-27.48)	0.24 (0.17-0.39)
Sone River																
4.	Hatigond	60 (6-193)	72 (42-98)	10.9 (6.8-17.6)	0.084 (0.056-0.280)	0.005 (0-0.035)	1.91 (0.28-3.92)	945 (45-2300)	200 (122-294)	0.57 (0.23-1.09)	0.066 (0.003-0.438)	119 (74-168)	68 (38-100)	14.92 (5.78-25.06)	14.02 (6.84-22.88)	0.25 (0.13-0.46)
❖	**Class 'C'**	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	**Class 'E'**	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

(G) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Budhabalanga river												
1.	Baripada D/s	1.989 (0.166-3.656)	0.206 (0.001-1.162)	<0.002	0.015	0.704	0.004	0.004	0.014	0.0006	0.00035	0.008
2.	Balasore U/s	1.971 (0.481-4.758)	0.291 (0.001-1.990)	<0.002	0.018	2.815	0.004	0.003	0.005	0.0005	0.00032	0.001
3.	Balasore D/s	3.257 (0.534-8.118)	0.150 (0.002-0.380)	0.005	0.037	6.385	0.006	0.005	0.067	0.0006	0.00067	0.005
Sone River												
4.	Hatigond	2.202 (0.367-6.037)	0.158 (0.002-0.724)	<0.002	0.018	1.168	0.004	0.004	0.013	0.0007	0.00051	0.005
❖	**Class 'C'**	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖	**Class 'E'**	-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(H) Kolab river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
Kerandi river																
1.	Sunabeda	72 (39-212)	43 (16-136(	10.0 (3.9-15.8)	0.168 (0.056-0.400)	0.006 (0.001-0.026)	2.90 (0.56-14.00)	539 (20-2400)	128 (68-371)	0.33 (0.02-0.94)	0.024 (0.004-0.077)	74 (39-212)	43 (18-120)	9.49 (3.99-40.40)	9.41 (3.10-14.67)	0.24 (0.09-0.42)
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

(H) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Kerandi river												
1.	Sunabeda	3.180 (0.590-5.834)	0.088 (0.005-0.191)	<0.002	0.011	0.893	0.005	0.004	0.013	0.0004	0.00076	0.003
❖ Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(I) Vansadhara river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
Vansadhara river																
1.	Muniguda	80 (1-229)	82 (62-132)	9.5 (3.9-15.8)	0.134 (0.056-0.440)	0.005 (0-0.025)	2.31 (0.28-5.88)	255 (20-700)	191 (154-311)	0.37 (0.26-0.68)	0.032 (0.003-0.081)	113 (92-172)	78 (54-136)	10.09 (7.40-15.99)	9.49 (2.40-18.53)	0.40 (0.16-1.57)
2.	Gunupur	129 (4-602)	93 (58-136)	11.1 (3.6-27.8)	0.107 (ND-0.336)	0.006 (0-0.028)	1.87 (0.28-5.60)	703 (20-2400)	205 (135-261)	0.34 (0.22-0.73)	0.051 (0.003-0.105)	119 (84-148)	83 (44-112)	9.09 (7.40-11.99)	7.57 (2.11-11.94)	0.27 (0.15-0.50)
❖	**Class 'C'**	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	**Class 'E'**	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

(I) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Vansadhara river												
1.	Muniguda	4.247 (0.455-19.093)	0.128 (0.004-0.541)	<0.002	0.018	1.142	0.006	0.004	0.018	0.0004	0.00006	0.002
2.	Gunupur	2.821 (0.407-5.010)	0.097 (0.001-0.231)	<0.002	0.015	5.722	0.006	0.006	0.021	0.0006	0.00013	0.009
❖	**Class 'C'**	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖	**Class 'E'**	-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(J) Indravati river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
Indravati river																
1.	Nawarangpur	75 (20-274)	46 (20-78)	9.7 (3.9-20.3)	0.169 (0.056-0.560)	0.005 (0-0,0.39)	3.71 (0.28-12.88)	256 (<1.8-1300)	115 (86-149)	0.30 (0.21-0.50)	0.027 (0.003-0.077)	70 (54-88)	423 (28-64)	6.53 (5.50-7.99)	9.63 (1.24-18.40)	0.23 (0.10-0.44)
❖	Class 'C'	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	Class 'E'	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

((J) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Indravati river												
1.	Nawarangpur	4.147 (0.547-11.117)	0.074 (0.003-0.199)	<0.002	0.015	1.250	0.003	0.004	0.011	0.0004	0.00019	0.006
❖	Class 'C'	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖	Class 'E'	-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(K) Bahuda river system (2018)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)		(mg/l)					
Bahuda river																
1.	Damodarpally	64 (13-314)	149 (84-238)	9.3 (6.6-14.5)	0.201 (BDL-0.900)	0.018 (0-0.113)	2.47 (0.28-12.32)	556 (45-1700)	362 (191-517)	0.53 (0.28-0.85)	0.388 (0.004-1.972)	196 (118-282)	137 (86-202)	22.79 (13.00-32.98)	8.53 (1.99-22.10)	0.428 (0.280-0.77)
❖	**Class 'C'**	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖	**Class 'E'**	-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

(K) Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual Average values (Range of values)										
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Bahuda river												
1.	Damodarpally	6.966 (0.577-51.454)	0.051 (0.001-0.172)	0.008	0.025	0.556	0.008	0.003	0.059	0.0005	<0.00006	0.013
❖	**Class 'C'**	50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
❖	**Class 'E'**	-	-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2018

(A) Canal Water Quality Monitoring

Board regularly monitors the water quality of Taladanda canal at six stations and of Puri canal at three stations.

Taladanda canal originates from Mahanadi river at Jobra of Cuttack, passes through the city and finally culminates at Paradeep after covering a distance of 82 Km. The canal was constructed for the purpose of navigation and/ or irrigation of a part of Mahanadi delta of Cuttack and Jagatsinghpur districts. Besides this, the canal is also a source of fresh water for industries and the port at Paradeep. The canal water is also used for bathing and other domestic activities all along its stretch.

Board monitors the water quality of Taldanda canal within Cuttack city at five locations viz. Jobra, Ranihat, Chhatrabazar, Nuabazar, Biribati and one station at Atharabanki of Paradeep. The water quality data at these five stations with respect to critical parameters such as pH, DO, BOD, TC, FC, EC, SAR and B during 2018 are given in Table-5.20 and compared with the tolerance limits for Bathing water quality prescribed under E (P) Rule, 1986 and Class B (Outdoor bathing) and Class E (Irrigation) Inland surface water quality prescribed by Bureau of Indian Standards (IS: 2296-1982). The water quality of Taladanda canal at these locations remained well within the tolerance limit prescribed for Class-E inland surface water bodies. However, so far the bathing water quality is concerned, total coliform organisms and fecal coliform organisms remain above the prescribed limit for Class- B at all the monitoring stations most of the time during the period of study in 2018, whereas BOD values exceeded the tolerance limit only once at Chhatrabazar, Biribati and Atharabanki.

Puri canal originates from Mahanadi river near Munduli barrage of Cuttack. The 42 Km long canal was constructed for the purpose of irrigation of Puri district and a part of Khordha district. The canal water is also used for bathing and other domestic activities all along its stretch. Board monitors the water quality of Puri canal at three locations viz. Hansapal, Jagannathpur and Chandanpur . The water quality of Puri canal at these locations remained well within the tolerance limit prescribed for Class-E inland surface water bodies. However, so far the bathing water quality is concerned, total coliform organisms and fecal coliform organisms remain above the prescribed limit for Class- B at all the monitoring stations most of the time during the period of study in 2018, whereas BOD values exceeded the tolerance limit only once at Hansapal and Jagannathpur.

Water quality for other parameters given in Table-5.21(a) and (b) remain well within the tolerance limit for Class - C water quality.

Table-5.20 Water Quality of Canals with respect to Criteria parameters during 2018 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	DO	BOD	TC	FC			
Taladanda canal														
1.	Jobra*	3	7.7 (7.3-8.1)	7.9 (6.6-8.8)	1.1 (0.7-1.6)	16133 (2400-35000)	13030 (790-35000)	0	0	2$ (67) 3$$ (100)	2 (67)	Does not conform to Class B,C	TC,FC	Human activities
2.	Ranihat*	3	7.7 (7.6-7.9)	7.2 (6.6-8.2)	1.7 (1.1-2.5)	160000 (160000 -160000)	160000 (160000 -160000)	0	0	3$ (100) 3$$ (100)	3 (100)	Does not conform to Class B & C	TC,FC	Human activities and waste water of Cuttack town
3.	Chatrabazar*	3	7.7 (7.7-7.8)	6.9 (6.2-8.1)	1.8 (1.1-3.2)	114667 (92000-160000)	92000 (92000-92000)	0	1 (33)	3$ (100) 3$$ (100)	3 (100)	Does not conform to Class B & C	BOD, TC,FC	
4.	Nuabazar*	3	7.5 (7.0-7.8)	7.2 (6.8-8.0)	1.6 (0.8-2.2)	95667 (35000-160000)	80667 (28000-160000)	0	0	3$ (100) 3$$ (100)	3 (100)	Does not conform to Class B & C	TC,FC	
5.	Birribati*	3	7.6 (7.3-7.7)	6.6 (5.9-7.8)	2.3 (1.5-3.3)	112000 (16000-160000)	76667 (16000 -160000)	0	1 (33)	3$ (100) 3$$ (100)	3 (100)	Does not conform to Class B & C	BOD, TC,FC	
6.	Atharabanki	12	7.8 (7.2-8.2)	6.5 (1.4-8.2)	1.7 (0.8-5.7)	18843 (330-92000)	9502 (110-54000)	0	1 (8)	6$ (50) 9$$ (75)	6 (50)	Does not conform to Class B & C	BOD, TC,FC	Human activities
*****Class 'C'**			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**		**Drinking water source with conventional treatment followed by disinfection**						
*****Class 'B'**			**6.5-8.5**	**5 and above**	**3 or less**	**500 or less**		**Outdoor bathing**						
Water quality criteria for bathing water			**6.5-8.5**	**5 and above**	**3 or less**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)**						

* **Data for the period January, August and October, 2018**

*** **Tolerance limits for Inland Surface water bodies (IS-2296-1982)** $ **for Class C and** $$ **for Class B**

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis: (Ref : IS 2296-1982 foot note)

For Class B : TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.

For Class C : TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

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Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	DO	BOD	TC	FC			
(b) Puri canal														
1.	Hansapal*	11	7.7 (6.7-8.4)	7.8 (6.2-13.3)	1.5 (0.7-4.9)	4981 (790-16000)	2341 (330-9200)	0	1 (9)	3$ (27) 12$$ (100)	2 (18)	Does not conform to Class B,C	BOD, TC,FC	Human activities
2.	Jagannathpur	12	7.8 (6.8-8.2)	7.0 (4.6-9.6)	1.7 (0.6-4.0)	5503 (330-16000)	2578 (130-9200)	0$ 1$$ (9)	1 (9)	3$ (25) 11$$ (92)	4 (33)	Does not conform to Class B & C	DO, BOD, TC,FC	Human activities
3.	Chandanpur**	11	7.9 (7.4-8.6)	6.2 (2.9-8.9)	1.1 (0.4-2.0)	3434 (140-16000)	1678 (40-9200)	1$ (9) 3$$ (27)	0	2$ (18) 8$$ (73)	2 (18)	Does not conform to Class B & C	DO, TC,FC	
*****Class 'C'**			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**		**Drinking water source with conventional treatment followed by disinfection**						
*****Class 'B'**			**6.5-8.5**	**5 and above**	**3 or less**	**500 or less**		**Outdoor bathing**						
Water quality criteria for bathing water			**6.5-8.5**	**5 and above**	**3 or less**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)**						

* **Data for the period January - December 2018 excluding March**

** **Data for the period January - December 2018 excluding January**

*** **Tolerance limits for Inland Surface water bodies (IS-2296-1982)** $ **for Class C and** $$ **for Class B**

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis: (Ref : IS 2296-1982 foot note)

For Class B : TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.

For Class C : TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values) Parameters				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	EC (microSiemens /cm)	SAR	B (mg/l)	EC	SAR	B			
(a) Taladanda canal												
1.	Jobra*	3	7.7 (7.3-8.1)	190 (174-199)	0.44 (0.33-0.50)	0.0 (0.014-0.06)	0	0	0	Conform to Class E		
2.	Ranihat*	3	7.7 (7.6-7.9)	192 (184-198)	0.42 (0.35-0.49)	0.0 (0.01-0.46)	0	0	0	Conform to Class E		
3.	Chatrabazar*	3	7.7 (7.7-7.8)	199 (195-202)	0.51 (0.34-0.63)	0.1 (0.063-0.091)	0	0	0	Conform to Class E		
4.	Nuabazar*	3	7.5 (7.0-7.8)	195 (177-208)	0.38 (0.29-0.51)	0.1 (0.038-0.091)	0	0	0	Conform to Class E		
5.	Birribati*	3	7.6 (7.3-7.7)	220 (154-299)	0.78 (0.35-1.49)	0.1 (0.035-0.077)	0	0	0	Conform to Class E		
6.	Atharabanki**	12	7.8 (7.2-8.2)	343 (139-984)	1.59 (0.30-8.32)	0.0 (0.004-0.224)	0	0	0	Conform to Class E		
(b) Puri canal												
1.	Hansapal#	11	7.7 (6.7-8.4)	191 (134-248)	0.65 (0.22-3.60)	0.1 (0.01-0.256)	0	0	0	Conform to Class E		
2.	Jagannathpur	12	7.8 (6.7-8.4)	203 (161-284)	0.45 (0.28-0.82)	17.9 (0.003-143)	0	0	0	Conform to Class E		
3.	Chandanpur##	11	7.9 (7.4-8.6)	225 (153-326)	0.58 (0.23-1.88)	0.1 (0.03-0.126)	0	0	0	Conform to Class E		
***** Class 'E'**			**6.5-8.5**	**2250 or less**	**26 or less**	**2 or less**				**Irrigation, Industrial Cooling or controlled waste disposal**		

* Data for the period January, August, October, 2018
** Data for the period January-December, 2018
# Data for the period January-December, 2018 excluding March
Data for the period January-December, 2018 excluding January
*** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Table-5.21 (a) Water Quality of Taladanda Canal with respect to other parameters during 2018

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(mg/l)				
1.	Jobra*	25 (4-50)	79 (68-94)	9.1 (7.5-11.2)	0.056 (0.056-0.056)	0.002 (0.001-0.004)	2.80 (1.12-5.60)	118 (106-127)	71 (66-76)	9.01 (7.40-9.99)	16.37 (8.58-24.87)	0.29 (0.25-0.33)
2.	Ranihat*	57 (7-146)	75 (68-82)	16.9 (8.5-27.3)	0.206 (0.056-0.450)	0.008 (0.001-0.018)	5.60 (3.36-8.96)	119 (112-126)	71 (66-74)	11.60 (9.30-13.50)	17.07 (13.30-22.38)	0.29 (0.26-0.33)
3.	Chhatrabazar*	39 (3-86)	79 (68-96)	15.4 (13.1-18.7)	0.246 (0.056-0.570)	0.008 (0.002-0.020)	5.79 (1.68-7.84)	124 (122-125)	74 (72-78)	11.71 (7.40-17.75)	17.78 (12.18-23.01)	0.29 (0.26-0.32)
4.	Nuabazar*	52 (5-96)	77 (64-84)	17.0 (13.1-19.3)	0.541 (0.168-1.230)	0.016 (0-0.043)	8.77 (3.92-15.12)	116 (106-122)	70 (64-74)	8.98 (8.30-9.64)	16.62 (11.69-21.51)	0.30 (0.26-0.33)
5.	Biribati*	41 (8-98)	72 (36-96)	19.6 (16.1-22.4)	0.559 (0.112-1.340)	0.016 (0.007-0.040)	5.71 (1.68-12.32)	134 (86-187)	68 (52-76)	20.97 (8.30-44.97)	17.16 (11.32-21.51)	0.29 (0.25-0.33)
6.	Atharabanki**	55 (7-120)	97 (48-176)	16.4 (7.6-57.8)	0.214 (0.056-0.900)	0.027 (0.001-0.224)	4.36 (0.56-12.88)	190 (76-655)	94 (52-188)	40.24 (7.71-299.85)	18.07 (4.10-66.90)	0.40 (0.19-0.60)
***Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
***Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

* Data for the period January, August, October, 2018
** Data for the period January-December, 2018
*** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

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Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
1.	Jobra*	1.385 (0.174-2.248)	0.048 (0.015-0.095)	Not analysed								
2.	Ranihat*	3.334 (2.781-4.116)	0.104 (0.019-0.186)	Not analysed								
3.	Chhatrabazar*	1.864 (1.015-3.105)	0.065 (0.019-0.150)	Not analysed								
4.	Nuabazar*	2.514 (2.117-3.262)	0.065 (0.022-0.150)	Not analysed								

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
5.	Biribati*	2.289 (2.003-2.598)	0.082 (0.014-0.141)	Not analysed								
6.	Atharabanki**	3.283 (0.833-12.595)	0.157 (0.002-1.199)	0.015	0.032	2.157	0.004	0.013	0.026	0.0008	<0.00006	0.009
***Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period January, August and October, 2018
** Data for the period January-December, 2018
Data for the April, 2018
*** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

DO : Dissolved Oxygen, BOD : Biochemical Oxygen Demand, TC : Total Coliform, TSS : Total Suspended Solids; COD : Chemical Oxygen Demand, NH_4-N : Ammonical nitrogen, TKN : Total Kjeldahl Nitrogen;
FC : Fecal Coliform, EC : Electrical Conductivity, TDS : Total Dissolved Solids, B : Boron ; SAR : Sodium Absorption Ratio, TH : Total hardness; Cl : chloride, SO_4 : Sulphate; F : Fluoride; PO_4^{3-} : Phosphate, :
Cr(VI) : Hexavalent Chromium; T.Cr : Total Chromium, Fe : Iron, Ni : Nickel, Cu : Copper, Zn : Zinc;
Cd : Cadmium; Hg : Mercury; Pb : Lead

Table- 5.21 (b) Water Quality of Puri Canal with respect to other parameters during 2018

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(mg/l)				
1.	Hansapal*	44 (11-120)	79 (60-100)	13.9 (5.7-41.2)	0.097 (0.056-0.220)	0.008 (0-0.036)	2.11 (0.28-5.04)	111 (68-145)	72 (52-88)	11.98 (7.40-20.20)	11.86 (4.85-19.65)	0.35 (0.22-0.64)
2.	Jagannathpur$	45 (6-96)	77 (60-96)	16.4 (8.5-48.9)	0.149 (0.056-0.330)	0.014 (0 -0.090)	2.36 (0.28-5.60)	119 (94-154)	72 (60-88)	14.58 (9.99-25.98)	12.91 (5.84-20.89)	0.33 (0.20-0.57)
3.	Chandanpur**	41 (14-80)	82 (60-98)	11.7 (7.8-17.8)	0.132 (0.056-0.224)	0.011 (0.001-0.055)	2.55 (0.56-11.20)	132 (92-184)	79 (60-94)	14.75 (7.71-41.97)	16.54 (6.22-26.86)	0.40 (0.21-0.61)
***Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
***Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
1.	Hansapal*	2.411 (0.426-5.834)	0.117 (0.004-0.750)	0.015	0.032	2.157	0.004	0.013	0.026	0.0008	<0.00006	0.009
2.	Jagannathpur	2.183 (0.446-6.780)	0.095 (0.001-0.280)	<0.002	0.013	2.540	0.011	0.004	0.030	0.0007	0.00013	0.004
3.	Chandanpur**	2.269 (0.087-4.415)	0.333 (0.001-2.177)	<0.002	0.018	0.678	0.011	0.012	0.008	0.0006	0.00013	0.005
***Class 'C'		50	-	0.05	<0.002	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

*** Data for the period January-December, 2018 excluding March**
**** Data for the period January-December, 2018 excluding January**
$ Data for the period January-December, 2018
Data for the April, 2018
***** Tolerance limits for Inland Surface water bodies (IS-2296-1982)**

(B) Ponds Water Quality Monitoring

Board is regularly monitoring the water quality of eight ponds such as Bindusagar pond in Bhubaneswar, five religious ponds (Narendra, Markanda, Indradyumna, Swetaganga and Parvati Sagar) in Puri town, Jagannathsagar pond in Jeypore town, and Raniguda pond in Angul town. The annual average and range values of the criteria parameters such as pH, DO, BOD, TC and FC during 2018 in these eight ponds are given in Table-5.22. As these ponds are mostly used for bathing purposes, water quality data are compared with the bathing water quality. Comparison of the data with the tolerance limits for Class-B (Bathing water quality), specified by CPCB and water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000) reveals non-compliance at these monitoring stations excluding Jagannath Sagar pond with respect to DO, BOD, TC and FC for most time of the observation period during 2018 . Frequent deviation in pH values in all the five ponds in Puri town have also been observed. In Jagannath sagar pond only total coliform population has been observed to exceed the tolerance limit of 500 MPN/ 100 ml for most period of the observation during 2018. Water quality with respect to other parameters are given in Table-5.23 which remained within the tolerance limits for Class 'C'.

(C) Lakes Water Quality Monitoring

The Board is regularly monitoring the water quality of Chilika lake at two stations (Rambha and Satapada), four stations on Anshupa lake (Kadalibari, Bishnupur Subarnapur and Sarandagarh) and one station on Tampara lake (Tampara). Annual average and range values of the water quality parameters of these lakes during the year 2018 are given in Table-5.24 and Table-5.25. Assessment of the water quality status of the lakes have been done based on the best use of water body made by the society as well as the type of water body.

As Chilka is a brackish water lake and the predominant activities at the monitoring stations such as Rambha and Satapada are contact water sports and commercial fishing, the water

quality criteria parameters are compared with Class SW-II. Comparison of the water quality data of Chilka lake with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) (Table-5.24(a)) reveals non-compliance with respect to fecal coliform values at both Rambha and Satapada. The probable cause of downgrading the water quality of lake may be due to human activities in the lake.

Anshupa and Tampara lakes are sweet water lakes and the predominant activity in these lake are fish propagation. Comparison of the water quality data of Anshupa lake and Tampara lake (Table-5.24(b))with the water quality criteria for Class-D surface water bodies (Fish culture and wild life propagation) reveals compliance with respect to all the criteria parameters. However, frequent deviation in Biochemical Oxygen Demand (BOD) and Total coliform (TC) values (Table-5.25(b) from the tolerance limits (3.0 mg/l and 5000 MPN/100 ml respectively) laid down for Class-C (drinking water source with conventional treatment followed by disinfection) are observed at all the monitored locations of Anshupa and Tampara lake. The probable cause of downgrading the water quality of lake may be due to eutrophic condition of the lakes, human activities etc in the lake.

(D) Coastal Water Quality Monitoring

Coastal water quality near Puri town at three locations (Swargadwara, Baliapanda and Bankimuhan), Gopalpur at one location and Paradeep at one location are being regularly monitored by the Board. Annual average and range values of the water quality parameters of the sea at these five locations during the year 2018 are given in Table -5.26 and Table-5.27. Assessment of the coastal water quality status have been done based on the best use and type of activities in the coastal segment.

Comparison of the coastal water quality data at Puri with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) reveals frequent non-compliance with respect to fecal coliform values at all the three locations of Puri and single non-compliance at Gopalpur and Paradeep. This may be attributed to the human activities and discharge of domestic wastewater into the sea.

Comparison of the coastal water quality at Gopalpur and Paradeep with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) and SW-IV (for Harbour water) reveals compliance with the desired class.

Table -5.22 (a) Water Quality of Ponds with respect to Criteria parameters during 2018 (January- December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(a) Bindusagar Pond in Bhubaneswar City															
1.	Lingaraj Temple side	12	7.7 (7.1-8.4)	6.0 (3.5-7.7)	2.8 (1.0-4.9)	62561 (170-160000)	57600 (78-160000)	0	2 (17)	5 (42)	10 (83)	7 (58)	Does not conform to Class B	DO,BOD, TC,FC	Human activities
2.	Ananta Vasudev	12	7.7 (6.7-8.6)	6.9 (4.5-12.4)	2.7 (1.0-5.3)	23584 (230-160000)	17971 (78-160000)	1 (8)	1 (8)	4 (33)	10 (83)	5 (42)		pH, DO,BOD, TC,FC	
3.	Gyananagar	12	7.6 (6.8-8.4)	5.5 (1.2-8.9)	3.5 (0.9-6.9)	79659 (98->160000)	57524 (20-160000)	0	4 (33)	5 (42)	10 (83)	8 (67)		DO,BOD, TC,FC	
4.	Near Kedarnath Research Centre	12	7.9 (7.0-8.4)	7.5 (2.4-11.5)	2.6 (1.0-4.3)	18361 (330->160000)	15429 (130-160000)	0	1 (8)	4 (33)	11 (92)	5 (42)		DO,BOD, TC,FC	
***Class 'B'**			**6.5-8.5**	**5 and above**	**3 or less**	**500 or less**		**Outdoor bathing**							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			**6.5-8.5**	**5 and above**	**3 or less**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing**							

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(b) Ponds (Puri)															
1.	Narendra	12	8.5 (8.0-9.1)	10.0 (5.0-13.4)	7.1 (3.8-11.3)	5353 (<1.8->16000)	1782 (<1.8-16000)	6 (50)	0	12 (100)	9 (75)	1 (9)	Does not conform to Class B	pH, BOD, TC,FC	Human activities
2.	Markanda	12	8.1 (7.3-9.0)	11.6 (4.7-18.3)	6.3 (3.6-8.1)	7922 (<1.8->16000)	3625 (<1.8-16000)	3 (25)	2 (17)	12 (100)	9 (75)	5 (42)	Does not conform to Class B	pH, DO, BOD, TC,FC	
3.	Indradyumna	12	8.1 (7.6-8.8)	7.8 (3.3-12.9)	4.7 (3.2-7.0)	11639 (270-54000)	3222 (78-16000)	2 (17)	3 (25)	12 (100)	11 (92)	3 (25)	Does not conform to Class B	pH, DO, BOD, TC,FC	
4.	Swetaganga	12	7.9 (6.6-9.0)	6.3 (1.6-12.9)	9.2 (4.1-16.4)	8166 (790-16000)	3150 (330-16000)	1 (8)	7 (58)	12 (100)	12 (100)	3 (25)	Does not conform to Class B	pH, DO, BOD, TC,FC	
5.	Parvati sagar	12	7.9 (6.6-8.9)	10.4 (4.8-14.8)	9.9 (3.1-17.8)	6413 (130-16000)	4260 (20-16000)	2 (17)	1 (8)	12 (100)	10 (83)	4 (33)	Does not conform to Class B	pH, DO, BOD, TC,FC	
***Class 'B'**			**6.5-8.5**	**5 and above**	**3 or less**	**500 or less**	-	**Outdoor bathing**							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			**6.5-8.5**	**5 and above**	**3 or less**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing**							

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters												
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(c) Pond in Jeypore town															
1.	Jagannathsagar Pond	12	7.7 (6.8-8.5)	7.0 (6.5-7.6)	1.7 (0.7-2.8)	1525 (45-4300)	605 (20-2500)	0	0	0	7 (58)	0	Does not conform to Class B	TC	Human activities
(d) Pond in Angul Town															
1.	Raniguda Pond	12	8.0 (7.4-8.8)	8.0 (2.3-16.2)	8.7 (2.5-18.1)	2732 (170-16000)	1780 (20-16000)	1 (8)	4 (33)	11 (92)	6 (50)	1 (8)	Does not conform to Class B	pH, DO, BOD, TC, FC	Human activities
***Class 'B'**			**6.5-8.5**	**5 and above**	**3 or less**	**500 or less**	-	**Outdoor bathing**							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			**6.5-8.5**	**5 and above**	**3 or less**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing**							

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.
(Ref : IS 2296-1982 foot note)

Table- 5.23 Water quality of Ponds with respect to other parameters during 2018 (January- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents							
		Annual average values (Range of values)													
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(µS/cm)		(mg/l)					
(a) Bindusagar Pond in Bhubaneswar City															
1.	Lingaraj Temple side	20 (4-38)	126 (104-150)	24.4 (6.6-49.5)	0.330 (0.056-0.840)	0.017 (0.001-0.084)	3.57 (0.56-14.00)	432 (387-477)	1.85 (1.18-3.24)	0.089 (0.035-0.148)	259 (224-298)	97 (76-116)	61.82 (40.70-99.95)	17.12 (2.86-67.20)	0.33 (0.20-0.48)
2.	Ananta Vasudev	12 (2-32)	122 (102-140)	23.1 (10.0-43.3)	0.425 (0.056-2.240)	0.029 (0-0.146)	2.33 (0.56-11.20)	425 (369-458)	1.66 (1.10-2.16)	0.090 (0.017-0.186)	250 (218-281)	96 (72-112)	60.53 (43.50-79.96)	13.80 (1.36-31.46)	0.33 (0.21-0.49)
3.	Gyananagar	20 (4-38)	130 (104-156)	26.5 (6.6-53.5)	0.154 (0.056-0.560)	0.005 (0-0.022)	2.36 (0.28-8.96)	436 (384-480)	1.71 (1.10-2.30)	0.080 (0.003-0.164)	257 (222-311)	98 (80-118)	62.73 (44.40-89.95)	13.54 (3.60-46.30)	0.35 (0.23-0.55)
4.	Near Kedarnath research Centre	27 (6-163)	123 (92-154)	22.7 (10.0-39.1)	0.200 (0.056-0.560)	0.014 (0-0.070)	2.36 (0.56-5.04)	416 (341-477)	1.81 (1.15-2.67)	0.068 (0.003-0.172)	247 (204-308)	92 (60-104)	60.38 (40.70-99.95)	12.31 (2.61-26.90)	0.33 (0.21-0.48)
*Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' : Drinking water source with conventional treatment followed by disinfection

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
(a) Bindusagar Pond in Bhubaneswar City												
1.	Lingaraj Temple side	6.630 (1.067-16.714)	0.188 (0.002-0.637)	0.002	0.015	1.4076	0.00613	0.0014	0.0052	0.0006	0.00063	0.0031
2.	Ananta Vasudev	5.751 (0.717-14.484)	0.165 (0.001-0.494)	0.015	0.029	1.448	0.00981	0.0036	0.0083	0.0006	0.00057	0.0086

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
3.	Gyananagar	3.855 (0.411-14.746)	0.077 (0.002-0.391)	0.012	0.021	1.1985	0.00569	0.0031	0.008	0.0006	0.00063	0.0026
4.	Near Kedarnath Research Centre	3.757 (0.446-14.877)	0.139 (0.001-0.547)	0.008	0.017	1.7748	0.00338	0.0049	0.0069	0.0006	0.00070	0.0046
*Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Data for the period April, 2018
Class 'C' : Drinking water source with conventional treatment followed by disinfection

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents							
		Annual average values (Range of values)													
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	EC (µS/cm	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)						(mg/l)					
Ponds in Puri town															
1.	Narendra	27 (4-136)	177 (130-268)	40.3 (20.4-80.3)	0.330 (0.056-1.120)	0.063 (0.003-0.168)	5.30 (0.56-18.76)	863 (642-1007)	2.02 (0.88-6.67)	0.162 (0.039-0.453)	579 (378-1240)	175 (136-252)	187.6 (60.0-599.7)	41.5 (26.4-57.1)	0.30 (0.16-0.47)
2.	Markanda	24 (2-42)	197 (162-232)	42.8 (21.8-73.9)	0.248 (0.056-0.670)	0.044 (0.002-0.190)	4.69 (0.56-12.88)	802 (608-1517)	4.38 (1.30-15.20)	0.241 (0.007-1.544)	427 (336-560)	200 (146-250)	93.06 (49.97-199.90)	50.34 (23.25-74.87)	0.28 (0.11-0.39)
3.	Indradyumna	14 (2-38)	103 (78-152)	37.8 (22.1-67.5)	0.364 (0.056-1.008)	0.029 (0.002-0.148)	6.35 (0.56-21.28)	514 (332-701)	3.72 (1.06-14.20)	0.097 (0.003-0.425)	362 (194-1160)	91 (66-126)	135.16 (39.98-599.70)	25.72 (14.43-47.38)	0.28 (0.14-0.39)
4.	Swetaganga	32 (12-64)	205 (108-308)	55.6 (21.0-86.7)	0.382 (0.056-1.120)	0.043 (0-0.280)	5.93 (1.12-15.12)	958 (528-1266)	1.89 (0.87-3.93)	0.230 (0.003-1.190)	643 (318-1570)	197 (104-280)	232.66 (69.96-849.90)	41.13 (6.21-61.44)	0.28 (0.09-0.49)
5.	Parvati sagar	32 (14-58)	123 (76-202)	70.5 (45.9-109.8)	0.369 (0.056-1.120)	0.030 (0-0.174)	5.37 (0.56-13.44)	412 (249-683)	3.89 (0.99-10.80)	0.075 (0.004-0.143)	293 (148-783)	116 (62-240)	80.83 (30.85-349.90)	24.24 (10.07-99.62)	0.28 (0.12-0.40)
*Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' : Drinking water source with conventional treatment followed by disinfection

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Ponds in Puri town												
1.	Narendra	6.170 (0.367-12.787)	0.311 (0.178-0.531)	<0.002	0.005	0.286	0.009	0.004	0.004	0.0019	0.00032	0.011
2.	Markanda	29.771 (11.815 68.878)	0.989 (0.240-3.733)	<0.002	0.015	0.418	0.007	0.005	0.006	0.0005	0.00019	0.012
3.	Indradyumna	4.448 (0.638-10.057)	0.126 (0.001-0.637)	<0.002	0.005	0.223	0.011	0.0033	0.0059	0.0006	0.00019	0.005
4.	Swetaganga	11.408 (2.440-34.697)	0.475 (0.044-1.506)	<0.002	0.007	0.750	0.009	0.0061	0.0061	0.0019	0.00013	0.017
5.	Parvati sagar	3.401 (0.499-7.772)	0.097 (0.001-0.403)	<0.002	0.018	0.556	0.009	0.0171	0.0084	0.0011	0.00063	0.008
*Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Data for the period April, 2018

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents							
		Annual average values (Range of values)													
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC (µS/ cm	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)						(mg/l)					
Pond in Jeypore town															
1.	Jagannathsagar	39 (6-134)	164 (34-256)	20.0 (9.7-41.6)	0.265 (0.056-0.780)	0.018 (0-0.104)	2.64 (0.28-7.28)	451 (93-639)	1.21 (0.35-1.55)	0.177 (0.004-1.544)	262 (58-352)	135 (30-196)	52.60 (6.70-71.96)	9.95 (1.12-24.62)	0.24 (0.11-0.40)
Pond in Angul town															
1.	Raniguda	66 (6-408)	236 (142-326)	65.4 (32.3-118.8)	0.219 (BDL-0.670)	0.017 (0-0.087)	3.66 (0.28-12.80)	795 (595-1020)	2.19 (0.69-6.25)	0.131 (0.003-0.560)	449 (58-722)	227 (168-302)	114.59 (51.97-299.85)	41.25 (13.18-96.60)	0.70 (0.48-0.96)
*Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Pond in Jeypore town												
1.	Jagannathsagar	3.947 (0.505-11.285)	0.104 (0.003-0.223)	<0.002	0.009	1.566	0.004	0.009	0.045	0.0006	<0.00006	0.004
Pond in Angul town												
1.	Raniguda	10.249 (2.043-28.715)	0.431 (0.031-1.242)	0.002	0.005	0.153	0.008	0.006	0.064	0.0004	0.00013	0.017
***Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Data for the period April, 2018
Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table 5.24 Water Quality of Lakes with respect to Criteria parameters during 2018 (January-December)

(a) Brackish Water Lake

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters											
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)	pH	DO	BOD	FC			
Chilka lake														
1.	Rambha	12	8.2 (7.9-8.1)	8.2 (6.2-11.0)	1.1 (0.3-2.0)	9.7 (0.9-48.0)	252 (<1.8-2200)	0	0	0	4 (33)	Does not conform to Class-SW-II	FC	Human activities
2.	Satapada	12	7.9 (7.4-8.3)	6.6 (5.1-8.1)	1.7 (1.0-2.7)	26.8 (7.3-85.0)	1163 (<1.8-9200)	0	0	0	6 (50)	Does not conform to Class-SW-II	FC	Human activities
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			**6.5-8.5**	**4.0 or more**	**3.0 or less**	**30 or less**	**100 or less**	**For Bathing, Contact Water Sports and Commercial Fishing**						

(b) Fresh Water Lake

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters										
			pH	DO (mg/l)	Free ammonia (mg/l)	EC (micro Siemens /cm)	pH	DO	Free ammonia	EC			
(a) Anshupa Lake													
1.	Kadalibari	12	7.7 (6.8-8.3)	7.6 (5.4-10.0)	0.014 (0-0.081)	171 (106-247)	0	0	0	0	D	-	-
2.	Bishnupur	12	7.6 (6.7-8.3)	7.2 (3.4-9.4)	0.006 (0-0.017)	162 (106-199)	0	1 (8)	0	0	D	-	-
3.	Subarnapur	12	7.5 (6.6-8.1)	7.6 (6.3-9.4)	0.005 (0-0.017)	158 (104-240)	0	0	0	0	D	-	-
4.	Sarandagarh	12	7.6 (6.9-8.2)	7.7 (4.8-11.0)	0.008 (0-0.028)	166 (105-206)	0	0	0	0	D	-	-
(b) Tampara Lake													
5.	Tampara	12	8.0 (7.3-8.5)	8.2 (4.5-12.5)	0.009 (0-0.033)	558 (323-934)	0	0	0	0	D	-	-
*Class 'D'			6.5-8.5	4 and above	1.2 or less	1000 or less	Fish Culture and Wild life propagation						

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Table 5.25 Water Quality of Lakes with respect to other parameters during 2018 (January-December)

(a) Brackish Water Lake

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteri-ological Parame-ter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	TDS	B	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/ 100 ml)	(mS/ cm)		(mg/l)					
Chilka lake																
1.	Rambha	129 (24-190)	140 (100-220)	28.2 (11.8-38.4)	0.227 (BDL-1.000)	0.025 (0-0.125)	2.94 (0.28-12.32)	476 (<1.8-3500)	19549 (12580-31890)	49.14 (15.76-100.10)	14069 (4820-25800)	0.939 (0.221-1.612)	1740 (900-3000)	7659.1 (2099.0-14992.5)	738.4 (155.50-1358.85)	0.49 (0.33-0.57)
2.	Satapada	362 (76-784)	122 (64-264)	39.6 (17.2-49.8)	0.223 (0.056-0.560)	0.011 (0.001-0.045)	3.45 (0.28-10.36)	1743 (<1.8-9200)	25687 (1950-55320)	50.11 (7.63-99.82)	21465 (1290-49100)	1.462 (0.003-3.532)	2785 (240-6300)	11771.4 (530.2-26986.5)	1063.8 (154.9-3662.9)	0.48 (0.23-0.77)

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
Chilka lake												
1.	Rambha	2.424 (0.103-7.940)	0.061(0.001-0.447)	0.008	0.021	1.158	0.005	0.008	0.026	0.0008	0.00032	0.008
2.	Satapada	2.907 (0.017-8.788)	0.091 (0.002-0.676)	<0.002	0.027	7.660	0.007	0.010	0.043	0.0006	0.00013	0.006

Data for the period April, 2018

(b) Fresh Water Lake

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameters		Mineral constituents						
		Annual average values (Range of values)														
		TSS	Total alkal -inity	BOD	COD	NH_4-N	TKN	TC	FC	TDS	B	SAR	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/ 100 ml)		(mg/l)			(mg/l)			
(a) Anshupa Lake																
1.	Kadlibari	38 (9-72)	69 (42-104)	2.4 (1.0-3.9)	20.3 (10.2-45.6)	0.289 (0.056-1.008)	4.69 (1.12-10.08)	2835 (230-9200)	1031 (20-3500)	100 (62-132)	0.064 (0.007-0.180)	0.42 (0.27-0.58)	61 (44-80)	11.76 (7.40-19.28)	6.68 (1.37-21.64)	0.31 (0.12-0.50)
2.	Bishnupur	20 (3-32)	66 (42-88)	2.4 (0.5-4.4)	19.1 (8.2-33.9)	0.215 (0.056-0.570)	4.27 (0.56-8.40)	2384 (78-5400)	907 (20-2400)	97 (62-118)	0.049 (0.003-0.147)	0.46 (0.36-0.61)	59 (42-78)	12.73 (7.40-17.99)	6.04 (2.11-23.13)	0.30 (0.17-0.42)
3.	Subarnapur	57 (1-302)	64 (44-92)	2.0 (0.6-4.3)	17.6 (6.1-28.8)	0.228 (0.056-0.900)	2.96 (0.56-6.72)	1602 (78-2800)	722 (20-2400)	95 (58-148)	0.039 (0.004-0.133)	0.45 (0.23-0.90)	56 (36-72)	11.84 (5.50-21.98)	6.94 (1.36-22.63)	0.30 (0.20-0.59)
4.	Sarandagarh	96 (1-264)	66 (38-96)	2.4 (0.8-4.8)	18.2 (1.2-34.5)	0.270 (0.056-0.560)	4.55 (1.40-11.20)	2648 (93-9200)	1113 (20-3500)	97 (58-118)	0.044 (0.003-0.136)	0.44 (0.28-0.72)	60 (44-80)	12.35 (7.40-19.99)	7.67 (1.24-24.87)	0.31 (0.19-0.48)
(b) Tampara Lake																
5.	Tampara	35 (16-71)	157 (106-206)	8.6 (4.4-16.9)	60.3 (29.9-90.3)	0.125 (BDL-0.336)	2.22 (0.56-4.48)	2083 (40-11000)	836 (20-3300)	357 (198-698)	0.147 (0.032-0.468)	2.30 (0.60-7.25)	145 (112-182)	95.45 (19.22-289.85)	28.72 (3.10-62.28)	0.44 (0.34-0.58)
*** Class 'C'**		-	-	3.0	-	-	-	5000		1500	-	-	-	600	400	1.5

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

Class 'C' : Drinking water source with conventional treatment followed by disinfection

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
(a) Anshupa Lake												
1.	Kadlibari	2.913 (0.055-6.482)	0.128 (0.001-0.356)	0.005	0.018	0.163	0.001	0.001	0.003	0.0005	<0.00006	0.005
2.	Bishnupur	3.566 (0.385-7.102)	0.129 (0.005-0.653)	0.003	0.027	1.158	0.008	0.006	0.040	0.0004	0.00032	0.007
3.	Subarnapur	3.410 (0.158-18.744)	0.175 (0.001-0.746)	0.01	0.03	0.245	0.002	0.003	0.002	0.0004	0.00025	0.002
4.	Sarandagarh	2.702 (0.411-10.452)	0.163 (0.001-0.778)	0.007	0.024	3.310	0.005	0.004	0.013	0.0004	0.00032	0.010
(b) Tampara Lake												
5.	Tampara	4.379 (0.170-22.546)	0.051 (0.001-0.130)	0.012	0.032	0.163	0.022	0.008	0.042	0.0014	0.00006	0.006
* Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

* Class 'C' : Drinking water source with conventional treatment followed by disinfection
Data for the period April, 2018

Table-5.26 Coastal Water Quality with respect to Criteria parameters during 2018 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values)					Frequency of violation (Percent of violation) from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters									
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)	BOD	FC			
1.	Puri											
(a)	Swargadwara	12	8.0 (7.6-8.4)	6.7 (5.8-7.9)	1.4 (0.5-2.8)	7.1 (1.0-23.0)	41 (<1.8-330)	0	2 (17)	SW-II		
(b)	Bankimuhan	12	7.9 (7.2-8.2)	6.5 (5.7-8.2)	1.4 (0.3-2.4)	7.1 (1.3-23.0)	2273 (<1.8-16000)	0	6 (50)	Does not confirm to Class-SW-II	FC	Human activities
(c)	Baliapanda	12	8.0 (7.5-8.3)	6.5 (5.2-7.6)	1.3 (0.5-2.4)	6.8 (1.6-14.0)	233 (<1.8-2400)	0	2 (17)	SW-II		
2.	Gopalpur	12	7.9 (7.5-8.2)	7.6 (5.8-9.8)	1.3 (0.5-2.3)	4.4 (0.5-14.0)	34 (<1.8-230)	0	1 (8)	SW-II		
3.	Paradeep	12	7.9 (7.4-8.1)	7.0 (6.1-8.6)	1.0 (0.2-2.6)	9.9 (2.1-41.0)	43 (<1.8-490)	0	1 (8)	SW-II		
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			**6.5-8.5**	**4.0 or more**	**3.0 or less**	**30 or less**	**100 or less***			**For Bathing, Contact Water Sports and Commercial Fishing**		

* The average value not exceeding 200/100 ml in 20 percent of samples in the year and in 3 consecutive samples in monsoon months.

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Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values)					Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters										
			pH	DO (mg/l)	BOD (mg/l)	O&G, mg/l	FC (MPN/100 ml)	BOD	O&G	FC			
1.	Gopalpur	12	7.9 (7.5-8.2)	7.6 (5.8-9.8)	1.3 (0.5-2.3)	0.6 (0.4-0.8)	34 (<1.8-230)	0	0	0	SW-IV		
2.	Paradeep	12	7.9 (7.4-8.1)	7.0 (6.1-8.6)	1.0 (0.2-2.6)	0.8 (0.6-1.2)	43 (<1.8-490)	0	0	0	SW-IV		
Water quality criteria for Class SW-IV Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-9.0	3.0 or more	5.0 mg/l or less	10 or less	500 or less				For Harbour Waters		

Table-5.27 Coastal Water Quality with respect to other parameters during 2018 (January- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriolo-gical parameter	Mineral constituents								
		Annual average values (Range of values)															
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/ 100 ml)	(µS/ cm)		(mg/l)						
1.	Puri																
(a)	Swargadwara	376 (162-618)	121 (80-164)	43.4 (30.9-59.4)	0.117 (BDL-0.560)	0.005 (0-0.013)	1.84 (0.28-4.48)	55 (<1.8-330)	46692 (35620-62200)	72.21 (48.16-92.47)	1.916 (0.021-3.492)	39617 (27600-52400)	5086 (3600-6800)	21559 (14942-28986)	2792 (2077-3539)	0.64 (0.45-1.00)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriolo-gical parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/ 100 ml)	(µS/ cm)		(mg/l)					
(b)	Bankimuhan	324 (65-548)	136 (88-232)	45.1 (27.2-59.4)	0.106 (BDL-0.330)	0.006 (0-0.018)	3.20 (0.06-7.56)	2718 (<1.8-16000)	45963 (34020-59950)	78.75 (57.56-104.64)	1.892 (0.003-3.126)	39634 (28400-53810)	4970 (3520-6600)	21602 (15424-29985)	2789 (2230-3719)	0.61 (0.39-1.00)
(c)	Baliapanda	350 (53-674)	125 (92-180)	43.2 (25.5-59.4)	0.177 (BDL-0.560)	0.012 (0-0.045)	2.66 (0.56-10.08)	270 (<1.8-2400)	45672 (34360-61080)	76.16 (55.11-101.93)	1.869 (0.045-3.215)	39254 (27200-54500)	5131 (3400-6600)	21360 (14460-30985)	2806 (2031-3719)	0.62 (0.42-1.20)
2.	Gopalpur	275 (14-508)	126 (92-154)	46.0 (32.1 (57.6)	0.102 (BDL-0.560)	0.004 (0-0.007)	2.59 (0.56-7.84)	114 (<1.8-790)	46646 (37820-59970)	71.33 (50.39-105.38)	2.081 (0.305-3.903)	37593 (29710-53100)	5426 (3440-6800)	20499 (15857-30485)	2640 (1095-3850)	0.64 (0.41-0.77)
3.	Paradeep	567 (136-1400)	125 (96-146)	45.4 (25.5-59.4)	0.102 (BDL-0.560)	0.008 (0-0.036)	2.87 (0.56-8.40)	91 (<1.8-940)	44428 (30180-56480)	78.21 (57.96-101.96)	2.159 (0.045-3.896)	36470 (23360-47100)	4871 (3680-5920)	19871 (12493-27986)	2580 (1327-3575)	0.60 (0.24-0.91)

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Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
1.	Puri											
(a)	Swargadwara	5.359 (0.529-35.490)	0.068 (0.001-0.278)	<0.002	0.018	1.142	0.007	0.020	0.041	0.0009	<0.00006	0.009
(b)	Bankimuhan	7.153 (0.316-47.213)	0.106 (0.001-0.321)	<0.002	1.193	1.193	0.007	0.018	0.024	0.0008	<0.00006	0.009
(c)	Baliapanda	5.675 (0.286-35.491)	0.103 (0.001-0.278)	<0.002	0.012	2.591	0.007	0.019	0.037	0.0008	<0.00006	0.009
2.	Gopalpur	1.605 (0 .486-5.790)	0.063 (0.001-0.331)	<0.002	0.013	0.561	0.008	0.003	0.014	0.0011	0.00006	0.008
3.	Paradeep	2.044 (0.596-4.809)	0.073 (0.001-0.221)	0.003	0.018	2.096	0.006	0.006	0.019	0.0016	<0.00006	0.008

Data for the period April, 2018

(E) Creek Water Quality Monitoring

Board monitors the water quality of Atharabanki creek on regular basis. The creek flows along the boundary wall of Paradeep Phosphate Ltd. (PPL) and joins river Mahanadi near its confluence with Bay of Bengal. Atharabanki river also act as a receiving water body for treated effluents from M/s Paradeep Phosphates Limited and M/s Indian Farmers Fertilizer Cooperative operating at Paradeep.

Annual average and range values of the water quality parameters of the creek during the year 2018 is given in Table-5.28. Assessment of the creek water quality status have been done based on the best use and type of activities in the water segment.

Comparison of the Atharabanki creek water quality data with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) reveals non-compliance with respect to DO, BOD and FC. This may be attributed to the discharge of domestic wastewater into the creek and other human activities. Fluoride concentration in the creek water varied with the range 0.28-8.00 mg/l with an annual average value of 3.47 mg/l.

Table-5.28 Water Quality of Atharabanki Creek during 2018 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)	pH	DO	BOD	FC			
1.	Atharabanki Creek	12	7.2 (6.9-7.7)	5.3 (2.6-8.2)	3.3 (0.8-7.9)	10.8 (4.5-24.0)	2709 (<1.8-16000)	0	3 (25)	4 (33)	12 (100)	Does not confirm to Class-SW-II	DO, BOD, FC	Human activities
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 or less	30 or less	100 or less					For Bathing, Contact Water Sports and Commercial Fishing		

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Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkalinity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(MPN/ 100 ml)	(µS/cm)		(mg/l)					
1.	Atharabanki Creek	161 (17-370)	116 (64-232)	29.6 (7.9-54.6)	0.300 (BDL-1.120)	0.001 (0-0.007)	4.7 (1.1-13.4)	3844 (20-16000)	16199 (1500-28760)	35.18 (0.29-72.07)	0.857 (0.070-2.440)	12317 (952-21290)	1652 (192-3800)	6508.9 (385.6-11994.0)	934.1 (84.1-2661.7)	3.47 (0.28-8.00)

Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/l)		(mg/l)								
1.	Atharabanki Creek	8.082 (1.120-18.076)	1.975 (0.268-8.068)	0.005	0.013	1.244	0.006	0.004	0.015	0.0008	0.00006	0.009

ND + Not Detected

Data for the period April, 2018

(F) Biomonitoring of Water Bodies

Biomonitoring of water quality is useful for assessing the over-all biological health of the water bodies. This indicates any disruption in ecological balance of the water bodies caused by the changes in its physical and chemical environment. Thus, measurement of the level of the ecological degradation would indicate the extent of pollution. Benthos are regarded as the best indicator of pollution as they are sedentary, sessile, long-lived and easily collectable.

To assess the actual health of water bodies, Central Pollution Control Board (CPCB) has derived a Biological Water Quality Criteria (BWQC) for water quality evaluation. This system is based on the range of saprobic values and diversity of the benthic macroinvertebrate families with respect to water quality. The entire taxonomic groups, with their range of saprobic score from 1 to 10, in combination with the range of diversity score from 0 to 1 has been classified into five groups as stated in Table-5.29.

Table- 5.29 Biological Water Quality Class

Sl. No.	Taxonomic Group	Range of Saprobic score	Range of Diversity score	Water Quality Characteristic	Water Quality Class
1	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Diptera	7 and more	0.2-1.0	Clean	A
2	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera	6-7	0.5-1.0	Slight Pollution	B
3	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera, Crustacea, Mollusca, Polychaeta, Coleoptera, Hirudinea, Oligochaeta	3-6	0.3-0.9	Moderate Pollution	C
4	Mollusca, Hemiptera, Coleoptera, Diptera, Oligochaeta	2-5	0.4 & less	Heavy Pollution	D
5	Diptera, Oligochaeta, No animals	0-2	0-0.2	Severe Pollution	E

Biomonitoring studies were carried out at 28 selected stations during 2018. Biological data generated from these stations were analysed for computing the saprobity indices (SI) and diversity indices (DI), which are presented in Table-5.30. From the Table it is evident that the biological water quality class at nine stations conform to the Class 'B-C' (slight to moderate pollution), at six stations conform to Class B (slight pollution) and at thirteen stations conform to Class C (moderate pollution) water quality.

Table-5.30 Biomonitoring of River Bodies (2018)

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
(A) Mahanadi				
1.	Brajarajnagar U/s	5.71	0.592	C
2.	Brajarajnagar D/s	6.30 (6.20-6.50)	0.57 (0.50-0.60)	B-C
3.	Sambalpur U/s	4.98 (4.70-5.25)	0.70 (0.60-0.79)	C
4.	Sambalpur D/s	4.89 (4.20-5.30)	0.65 (0.40-0.86)	C
5.	Cuttack U/s	6.16 (5.71-6.60)	0.68 (0.58-0.77)	B-C
6.	Cuttack D/s	4.73 (4.20-5.00)	0.58 (0.48-0.75)	C

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
7.	Cuttack U/s (Kathajodi)	5.90 (5.60-6.20)	0.46 (0.38-0.55)	B-C
8.	Cuttack D/s (Kathajodi)	5.60 (5.20-6.00)	0.54 (0.47-0.60)	C
9.	Bhubaneswar U/s (Kuakhai)	5.88 (5.16-6.60)	0.74 (0.70-0.77)	B-C
10.	Bhubaneswar D/s (Daya)	4.83 (4.20-5.25)	0.65 (0.55-0.75)	C
11.	Choudwar D/s (Birupa)	5.60 (5.30-5.80)	0.53 (0.37-0.68)	C
(B) Brahmani				
12.	Panposh U/s	5.70 (5.60-5.80)	0.69 (0.60-0.78)	C
13.	Panposh D/s	5.57 (5.40-5.70)	0.63 (0.54-0.82)	C
14.	Rourkela D/s	5.77 (5.75-5.80)	0.64 (0.58-0.70)	C
15.	Talcher U/s	5.83 (5.00-6.50)	0.63 (0.49-0.81)	B-C
16.	Talcher D/s	5.57 (5.22-5.80)	0.65 (0.52-0.73)	C
(C) Rushikulya				
17.	Potagarh	5.59 (4.68-6.50)	0.67 (0.51-0.83)	B-C
(D) Nagavali				
18.	Penta U/s	6.30 (6.20-6.50)	0.60 (0.52-0.75)	B
19.	J. K. Pur D/s	5.50 (5.00-6.00)	0.60 (0.40-0.80)	C
20.	Rayagada D/s	6.47 (6.40-6.50)	0.62 (0.54-0.75)	B
(E) Subarnarekha				
21.	Rajghat	6.35 (6.10-6.60)	0.63 (0.58-0.68)	B
(F) Budhabalnga				
22.	Baripada D/s	6.14 (5.57-6.70)	0.57 (0.56-0.58)	B-C
23.	Balasore U/s	5.58 (5.40-5.75)	0.52 (0.32-0.71)	C
24.	Balasore D/s	6.35 (6.00-6.70)	0.62 (0.47-0.77)	B-C
(G) Kerandi				
25.	Sunabeda	6.20 (6.20-6.20)	0.65 (0.60-0.70)	B
(H) Vansadhara				
26.	Muniguda	6.18 (6.00-6.33)	0.60 (0.48-0.75)	B-C
27.	Gunupur	6.22 (6.10-6.30)	0.53 (0.52-0.54)	B
(I) Indravati				
28.	Nawarangpur	6.6	0.7	B

G) Ground water quality status

The Board monitors ground water quality at 48 locations in eleven major towns of the State, such as, Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jajpur (Sukinda), Jhasruguda, Puri, Sambalpur and Talcher. Ground water quality status during the year 2018 at these locations alongwith the acceptable and Permissible limit for drinking water under IS : 10500-2012 are given in Table-5.31.

pH of ground water at Kuanrpur in Balasore, Kalpana-Laxmisagar area of Bhubaneswar during April and in Khandagiri and Capital Hospital area in Bhubaneswar during October is found to be beyond the permissible range of 6.5-8.5. pH at all other places remained well within the permissible range.

Fluoride in Kuanrpur of Balaosre and Kulad in Talcher area during the month of April and October and in MKCG Medical College area in Berhampur during the month of October exceeds the Permissible limit for drinking water i.e. 1.5 mg/l.

Frequent occurrence of total coliform and fecal coliform bacteria above the permissible limit (should be absent in 100 ml sample) are observed in the ground water at some of the monitored locations.

Table-5.31 Ground water Quality Status (Tube well) (2018)

Monitoring Station	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/l	COD, mg/l	Turbidity, NTU	TDS, mg/l	TFS	Total Alkalinity, mg/l	Total Hardness $CaCO_3$, mg/l	Calcium as Ca, mg/l	Magnesium as Mg, mg/l	Chloride, mg/l	Sulphate, mg/l	Nitrate, mg/l	NH_4-N, mg/l
1. ANGUL (2 stations)																
1. Angul Township	April	7.3	1120	0.6	4.0	15	658	624	316	316	83.2	26.3	145.9	83.58	34.697	ND
	Oct	7.8	1136	0.3	1.7	7.6	642	618	176	320	75.2	32.2	138.9	184.1	10.835	0.224
2. NALCO township	April	8.1	519	0.5	5.9	0.3	326	308	240	216	56	18.5	45.97	20.02	3.682	0.22
	Oct	7.9	703	0.5	3.4	9	386	362	194	246	52.8	27.8	22.2	124.1	7.552	0.224
2. BALASORE (3 stations)																
3. Naigo-palpur	April	8.1	131	0.2	2.0	6.4	84	68	64	52	15.2	3.4	7.99	4.85	7.093	0.79
	Oct	7.0	182	0.8	3.4	2	110	92	64	44	12	3.4	7.4	17.16	0.049	ND
4. Kuanrpur	April	8.6	253	0.5	4.0	3.2	145	124	28	62	17.6	4.4	46.97	10.39	2.265	ND
	Oct	7.6	344	0.5	1.7	3.5	186	174	74	68	19.2	4.9	57.4	12.4	1.508	ND
5. Chakulia	April	8.1	339	1.3	2.0	1.4	211	188	102	112	31.2	8.3	39.98	28.98	6.429	0.45
	Oct	6.8	459	0.3	1.7	3	268	248	102	146	43.2	9.3	59.3	47.51	6.920	ND
3. BERHAMPUR (4 stations)																
6. Near Railway station	April	7.9	973	0.4	7.9	2.1	542	512	208	268	68.8	23.4	126.9	88.68	1.533	ND
	Oct	7.4	1545	0.8	9.6	2.3	1012	996	332	356	94.4	29.2	342.6	98.9	32.117	ND
7. MKCG Medical College	April	8.1	736	0.3	13.9	6.2	429	402	180	180	54.4	10.7	111.9	47.14	5.834	ND
	Oct	8.1	854	0.3	11.5	6.5	468	446	244	250	60.8	23.9	101.9	54.72	0.529	0.224
8. Bus stand	April	7.7	1083	0.4	7.9	0.9	629	588	322	296	75.2	26.3	168.9	39.05	8.126	ND
	Oct	7.7	1232	0.6	7.8	13	972	926	398	292	65.6	31.2	342.6	34.7	0.371	0.112
9. Badabazar	April	7.9	904	0.5	5.9	1.6	531	498	86	144	40	10.7	196.9	84.82	0.842	ND
	Oct	7.4	1439	0.5	11.5	2.2	902	842	234	328	75.2	34.1	342.6	76.24	91.553	0.224

Monitoring Station	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/l	COD, mg/l	Turbidity, NTU	TDS, mg/l	TFS	Total Alkalinity, mg/l	Total Hardness $CaCO_3$, mg/l	Calcium as Ca, mg/l	Magnesium as Mg, mg/l	Chloride, mg/l	Sulphate, mg/l	Nitrate, mg/l	NH_4-N, mg/l
4. BHUBANESWAR (6 stations)																
10. Khandagiri Area	April	7.4	624	0.6	5.9	45	406	368	98	108	30.4	7.8	129.94	53.48	7.172	ND
	Oct	5.4	382	0.4	5.1	7.3	202	178	24	98	26.4	7.8	63	47.14	21.476	ND
11. Old town-Samantarapur Area	April	6.8	762	0.4	7.9	0.9	442	402	80	138	36.8	11.2	135.93	94.03	20.283	0.11
	Oct	7.3	658	0.5	3.4	6.6	252	224	206	194	40.8	22.4	42.6	55.1	14.484	0.056
12. Kalpana-Laxmisagar Area,	April	5.8	276	0.4	5.9	2.4	158	132	22	44	14.4	1.9	61.96	15.34	15.385	0.11
	Oct	6.8	624	0.5	6.8	9.3	222	198	104	146	33.6	15.1	17.8	61.69	20.397	ND
13. Chandra sekharpur	April	6.6	84	0.6	5.9	2.2	48	36	22	28	8	1.9	3.99	8.83	4.561	ND
	Oct	6.8	197	0.3	3.4	9.5	146	126	56	84	23.2	6.3	22.2	36.81	3.971	0.336
14. Capital Hospital Area	April	6.7	91	0.7	5.9	17	58	44	18	24	6.4	1.9	15.99	4.28	2.869	ND
	Oct	6.2	263	0.3	5.1	8.4	198	156	36	52	15.2	3.4	52.6	41.16	9.923	0.224
15. Secretariate-Governor House-Old bus stand Area	April	7.2	329	0.6	5.9	24	203	188	120	114	31.2	8.8	37.98	16.04	8.773	0.17
	Oct	6.7	302	0.6	5.1	9.5	192	176	100	120	31.2	10.2	22.2	42.78	5.160	ND
5. CUTTACK (5 stations)																
16. Jagatpur	April	8.2	819	0.2	4.0	3	445	402	186	232	65.6	16.6	85.95	83.58	35.957	ND
	Oct	8.0	689	0.3	3.4	8.8	388	324	190	210	44.8	23.9	76	53.48	36.578	ND
17. Mangalabag	April	8.4	217	0.3	5.9	5.9	143	128	112	118	36.8	6.3	11.99	6.46	6.953	0.11
	Oct	7.8	324	0.6	3.4	11	188	164	106	106	28.8	8.3	22	32.21	0.833	0.112
18. Madhupatna-Kalyan Nagar Area	April	8.0	382	0.3	4.0	0.5	214	188	102	104	32.8	5.4	51.97	17.53	5.729	ND
	Oct	8.2	435	0.4	3.4	14	242	216	116	118	28.8	11.2	50	30.97	0.827	ND
19. Badambadi Area	April	8.4	218	0.6	9.9	1.6	136	110	106	108	33.6	5.8	11.99	5.47	5.064	ND
	Oct	7.7	403	0.7	3.4	9.7	262	246	128	114	28.8	10.2	46	35.44	2.639	0.224
20. Bidanasi-Tulsipur Area	April	7.9	153	0.6	4.0	7.4	95	78	74	62	19.2	3.4	7.99	5.72	6.394	ND
	Oct	8.0	175	0.4	5.1	8.2	112	96	58	66	17.6	5.4	7.4	26.36	0.851	0.168

Monitoring Station	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/l	COD, mg/l	Turbidity, NTU	TDS, mg/l	TFS	Total Alkalinity, mg/l	Total Hardness $CaCO_3$, mg/l	Calcium as Ca, mg/l	Magnesium as Mg, mg/l	Chloride, mg/l	Sulphate, mg/l	Nitrate, mg/l	NH_4-N, mg/l
6. PARADEEP (JAGATSINGHPUR) (2 stations)																
21. Musadiha	May	7.9	6937	1.4	3.8	0.6	5280	4980	286	56	0	0.0	2998.5	5.34	2.694	0.608
	Oct	7.7	1365	1.7	15.3	1.2	846	816	248	140	33.6	13.6	388.7	16.42	10.288	0.112
22. Badapadia	May	7.8	2960	1.6	5.7	0.2	1880	1760	276	184	56	10.7	929.5	20.52	18.193	ND
	Oct	7.8	1939	1.3	8.5	1.1	1190	1150	260	54	16.8	2.9	629.7	12.81	9.285	0.056
7. SUKINDA (JAJPUR) (4 stations)																
23. TISCO	April	8.3	312	0.7	7.9	1.9	179	162	142	132	40	7.8	17.99	2.24	16.387	ND
	Oct	7.8	285	0.3	6.8	8.9	176	146	124	138	35.2	12.2	9.3	30.5	15.455	0.112
24. Saruabil	April	7.0	298	0.2	5.9	19	168	152	124	108	35.2	4.9	23.98	4.97	9.966	ND
	Oct	7.0	257	0.8	3.4	8.5	158	142	76	94	24.8	7.8	22.2	31.96	17.816	ND
25. Kaliapani	April	7.7	234	0.4	7.9	15	132	118	116	88	28	4.4	9.99	4.72	1.137	ND
	Oct	7.5	234	0.2	3.4	8.6	146	128	82	94	25.6	7.3	18.5	29.97	4.872	ND
26. Kamarda	April	7.5	142	0.3	4.0	22	88	70	80	66	19.2	4.4	5.99	0.497	1.119	ND
	Oct	8.1	491	14.6	95.3	8	274	204	170	190	57.6	11.2	18.52	58.95	6.105	ND
8. JHARSUGUDA (8 stations)																
27. Thelkoi	April	7.6	145	0.3	5.9	1.9	88	72	58	62	19.2	3.4	12.99	4.47	0.000	ND
	Oct	6.5	515	0.3	5.8	12	292	274	40	126	34.4	9.7	115.7	34.7	34.478	0.224
28. Bhurkhamunda	April	8.1	314	0.3	7.9	13	176	158	156	128	33.6	10.7	13.99	6.34	2.396	ND
	Oct	6.1	198	0.2	7.7	7	124	106	42	46	13.6	2.9	27.8	18.06	14.940	0.168
29. Badamal Industrial Estate	April	8.0	189	0.3	7.9	1.3	102	88	62	52	16.8	2.4	16.99	5.72	15.219	ND
	Oct	6.1	119	0.5	5.8	8	72	52	40	36	11.2	1.9	11.1	4.35	17.372	ND
30. Budhipadar	April	7.8	157	0.1	7.9	4.8	88	78	48	44	13.6	2.4	15.99	3.48	28.572	ND
	Oct	5.9	176	0.4	5.8	7.9	106	94	40	40	12	2.4	27.8	7.33	16.125	ND
31. Brajarajnagar Mining Belt	April	7.9	138	0.2	7.9	2.6	79	66	44	40	12.8	1.9	11.99	4.97	16.387	ND
	Oct	6.5	325	0.4	7.7	29	196	182	156	124	27.2	13.6	24.1	5.97	2.335	ND
32. Rampur (water tank)	April	8.1	187	1.8	17.8	13	108	88	82	64	19.2	3.9	10.99	8.83	2.578	ND
	Oct	6.6	329	0.5	5.8	34	194	180	152	122	26.4	13.6	24.1	5.09	0.827	ND
33. Ib thermal power station	April	8.2	294	0.6	7.9	6.4	162	132	122	96	27.2	6.8	24.98	4.47	2.651	ND
	Oct	6.7	333	0.4	7.7	34	192	168	162	126	29.6	12.7	22.2	4.85	0.675	ND
34. Belpahar Area	April	7.9	177	0.6	13.9	1.7	101	78	44	60	18.4	3.4	13.99	20.55	2.621	ND
	Oct	6.9	705	0.4	5.8	14	382	352	154	150	39.2	12.7	120.4	24	1.788	ND
9. PURI (4 stations)																
35. Hospital-Bus stand-Mausima temple area	April	8.5	398	0.2	4.0	3.2	254	222	186	182	53.6	11.7	34.98	7.21	2.370	ND
	Oct	7.6	1122	0.8	10.2	7.4	632	598	300	310	75.2	29.7	148.2	75.99	14.012	0.336

Monitoring Station	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/l	COD, mg/l	Turbidity, NTU	TDS, mg/l	TFS	Total Alkalinity, mg/l	Total Hardness $CaCO_3$, mg/l	Calcium as Ca, mg/l	Magnesium as Mg, mg/l	Chloride, mg/l	Sulphate, mg/l	Nitrate, mg/l	NH_4-N, mg/l
36. Near Jagannath Temple	April	8.3	1013	0.4	7.9	5.5	561	512	260	264	65.6	24.4	139.9	48.38	49.391	ND
	Oct	8.0	1051	0.2	3.4	8.6	640	610	144	80	20.8	6.8	224.5	76.99	2.904	0.224
37. Near Sea Beach,	April	8.2	18510	0.5	11.9	3.4	12850	12460	218	2000	320	292.4	6996.5	631.34	14.406	ND
	Oct	8.1	2480	0.2	3.4	5.6	1570	1520	148	344	38.4	60.4	611.2	258	23.677	0.224
38. Baliapanda	April	8.4	335	0.6	5.9	1.9	186	168	46	44	13.6	2.4	69.9	9.65	6.446	ND
	Oct	7.0	594	0.7	5.1	30	346	304	144	156	39.2	14.1	61.1	73.26	1.548	0.336
10. SAMBALPUR (3 stations)																
39. Near Panthanivas	April	8.0	466	0.6	7.9	9.8	252	232	110	120	38.4	5.8	54.97	31.34	21.057	ND
	Oct	6.8	375	0.4	7.7	11	212	184	64	122	32.8	9.7	48.1	40.4	31.505	ND
40. Near Railway station	April	8.1	1268	0.4	9.9	1.2	758	702	228	320	99.2	17.5	214.89	131.2	25.507	ND
	Oct	7.5	1164	0.2	11.5	2.5	762	724	160	420	128	24.4	260.2	136.2	31.548	ND
41. Near VSS Medical College, Burla	April	8.3	688	1.3	7.9	32	395	376	260	244	68.8	17.5	68.96	21.02	2.359	ND
	Oct	7.8	724	0.4	13.4	60	402	376	200	228	51.2	24.4	61.1	81.84	17.029	ND
11. TALCHER (7 stations)																
42. Mahanadi Coal Field Area	April	7.3	395	0.4	4.0	8.4	236	206	98	140	36.8	11.7	27.98	68.4	6.647	ND
	Oct	8.0	571	0.2	3.4	150	312	268	80	140	28.8	16.6	24.1	137.6	4.429	0.112
43. Kaniha	April	7.6	515	0.4	2.0	0.6	284	240	272	232	51.2	25.3	13.99	7.83	3.595	ND
	Oct	8.5	538	0.2	1.7	8.6	358	346	120	192	51.2	15.6	57.4	106.6	4.793	0.448
44. Talcher town	April	7.0	927	0.2	5.9	9.2	558	502	200	228	54.4	22.4	165.92	66.91	42.884	ND
	Oct	8.4	989	0.5	6.8	14	642	588	232	348	89.6	30.2	92.6	193.9	19.804	0.336
45. Meramundali Area	April	7.8	1037	0.3	2.0	0.3	619	588	436	432	108.8	39.0	69.96	74.74	19.898	0.33
	Oct	8.1	920	0.7	3.4	7.9	502	418	236	256	59.2	26.3	83.3	106.6	8.646	0.056
46. Talcher Thermal Area	April	7.3	1646	0.4	9.9	52	921	846	280	356	81.6	37.0	273.86	153.85	5.335	0.11
	Oct	7.9	1383	0.2	3.4	130	758	724	216	326	74.4	34.1	222.2	142.22	2.469	0.224
47. Banarpal	April	7.4	901	0.2	2.0	0.6	532	486	268	284	76.8	22.4	96.95	85.2	22.732	0.67
	Oct	7.9	993	0.4	3.4	12	552	502	142	292	67.2	30.2	106.5	180.6	0.468	0.448
48. Kulad	April	7.9	736	0.3	4.0	4.3	418	388	142	224	56	20.5	72.96	111.07	41.834	ND
	Oct	8.5	611	0.3	1.7	14	402	346	88	176	48	13.6	69.4	137.6	2.055	0.224
Drinking water specification (IS : 10500 (2012)																
Acceptable Limit		6.5-8.5	-	-	-	1	500	-	200	200	75	30	250	200	45	0.5
Permissible limit		No relax	-	-	-	5	2000	-	600	600	200	100	1000	400	No relax	No relax

Contd..

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/l	Fluoride, mg/l	PO_4^{3-}-P, mg/l	Sodium, mg/l	Potassium, mg/l	Boron, mg/l	Cr (VI), mg/l	Chromium Total, mg/l	Mercury ,mg/l	Cadmium, mg/l	Copper, mg/l	Lead, mg/l	Nickel, mg/l	Zinc, mg/l	Iron Total, mg/l	TC, MPN/ 100 ml	FC, MPN/ 100 ml
1. ANGUL (2 stations)																		
1. Angul Township	April	1.12	0.430	0.169	99.9	13.54	0.105	<0.002	0.008	0.00032	0.0015	0.005	0.009	0.013	0.064	0.179	23	4.5
	Oct	12.32	0.325	0.001	91.55	3.72	0.24	--	--	--	--	--	--	--	--	--	<1.8	<1.8
2. NALCO township	April	1.68	0.520	2.078	29.46	5.86	0.035	<0.002	0.015	0.00019	0.0008	0.003	0.002	0.002	0.011	0.250	<1.8	<1.8
	Oct	5.04	0.496	0.019	32.25	3.19	0.21	--	--	--	--	--	--	--	--	--	4.5	4.5
2. BALASORE (3 stations)																		
3. Naigopalpur	April	5.6	0.330	0.166	5.43	1.93	0.021	<0.002	0.005	0.00025	0.0006	0.005	0.007	0.007	0.006	1.387	<1.8	<1.8
	Oct	1.68	0.264	0.074	19.87	1.65	0.58	--	--	--	--	--	--	--	--	--	33	<1.8
4. Kuanrpur	April	0.56	5.100	0.167	29.95	6.83	0.446	<0.002	0.009	0.00063	0.0013	0.004	0.007	0.007	0.033	1.576	4.5	2
	Oct	1.68	4.370	0.062	42	1.65	0.55	--	--	--	--	--	--	--	--	--	23	<1.8
5. Chakulia	April	2.8	0.320	0.007	24.98	8.54	0.014	<0.002	0.011	0.00070	0.0009	0.002	0.009	0.009	0.014	0.128	<1.8	<1.8
	Oct	1.68	0.077	0.047	36.5	1.32	0.61	--	--	--	--	--	--	--	--	--	13	<1.8
3. BERHAMPUR (4 stations)																		
6. Berhampur near Railway station	April	0.56	0.330	0.051	82.95	17.9	0.039	0.007	0.018	<0.00006	0.0008	0.013	0.008	0.015	0.093	0.301	<1.8	<1.8
	Oct	3.92	0.841	0.031	231	1.2	0.08	--	--	--	--	--	--	--	--	--	<1.8	<1.8
7. MKCG medical College	April	1.68	1.500	0.039	78.25	11.25	0.011	0.002	0.011	0.00051	0.0007	0.006	0.007	0.009	0.066	2.351	<1.8	<1.8
	Oct	0.28	2.370	0.132	65.8	3.85	0.12	--	--	--	--	--	--	--	--	--	<1.8	<1.8
8. Bus stand	April	0.28	0.400	0.081	107.6	12.01	0.046	0.007	0.038	<0.00006	0.0008	0.009	0.007	0.015	0.057	0.321	<1.8	<1.8
	Oct	3.36	0.743	0.023	253.5	1.7	0.16	--	--	--	--	--	--	--	--	--	<1.8	<1.8
9. Badabazar	April	0.28	0.280	0.044	123.8	13.34	0.109	0.005	0.0021	0.00006	0.0004	0.004	0.007	0.015	0.081	0.541	<1.8	<1.8
	Oct	3.36	0.289	0.001	204.5	2.99	0.04	--	--	--	--	--	--	--	--	--	<1.8	<1.8
4. BHUBANESWAR (6 stations)																		
10. Khandagiri Area	April	0.56	0.130	0.015	88.6	20.3	0.046	0.008	0.023	0.00006	0.0004	0.008	0.009	0.009	0.086	9.476	<1.8	<1.8
	Oct	1.12	0.126	0.004	30.15	3.98	0.01	--	--	--	--	--	--	--	--	--	<1.8	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/l	Fluoride, mg/l	PO_4^{3-}-P, mg/l	Sodium, mg/l	Potassium, mg/l	Boron, mg/l	Cr (VI), mg/l	Chromium Total, mg/l	Mercury ,mg/l	Cadmium, mg/l	Copper, mg/l	Lead, mg/l	Nickel, mg/l	Zinc, mg/l	Iron Total, mg/l	TC, MPN/ 100 ml	FC, MPN/ 100 ml
11. Old town-Samantarapur Area	April	1.68	0.100	0.014	91.85	14.3	0.042	0.017	0.037	<0.00006	0.0007	0.011	0.005	0.008	0.078	0.332	<1.8	<1.8
	Oct	2.24	0.579	0.244	37.00	11.52	0.05	--	--	--	--	--	--	--	--	--	<1.8	<1.8
12. Kalpana-Laxmisagar Area	April	2.24	0.160	0.015	36.02	5.34	0.014	0.027	0.041	0.00013	0.0006	0.007	0.009	0.009	0.069	1.061	<1.8	<1.8
	Oct	2.24	0.109	0.001	13.62	7.4	0.05	--	--	--	--	--	--	--	--	--	<1.8	<1.8
13. Chandrasekharpur	April	1.12	0.180	0.013	2.91	1.11	0.014	0.017	0.027	<0.00006	0.0004	0.005	0.007	0.008	0.054	0.597	<1.8	<1.8
	Oct	1.12	0.166	0.007	10.01	1.38	0.09	--	--	--	--	--	--	--	--	--	<1.8	<1.8
14. Capital Hospital Area	April	1.68	0.100	0.013	10.43	2.6	0.025	0.023	0.033	0.00006	0.0007	0.007	0.005	0.003	0.065	2.489	<1.8	<1.8
	Oct	2.24	0.143	0.003	44.6	6.06	0.04	--	--	--	--	--	--	--	--	--	350	130
15. Secretariate-Governor House-Old bus stand Area	April	3.92	0.160	0.017	24.25	6.7	0.039	0.017	0.037	0.00070	0.0004	0.005	0.004	0.002	0.077	7.120	920	540
	Oct	3.36	0.158	0.008	11.09	7.08	0.07	--	--	--	--	--	--	--	--	--	<1.8	<1.8
5. CUTTACK (5 stations)																		
16. Jagatpur	April	1.12	0.370	0.148	58.6	9.71	0.053	0.003	0.023	0.00006	0.0004	0.006	0.010	0.009	0.022	0.663	<1.8	<1.8
	Oct	2.24	0.229	0.014	54.4	2.63	0.13	--	--	--	--	--	--	--	--	--	<1.8	<1.8
17. Mangalabag	April	1.68	0.380	0.066	7.4	3.61	0.005	0.003	0.028	0.00006	0.0004	0.007	0.007	0.007	0.067	0.959	4.5	<1.8
	Oct	6.72	0.296	0.001	18.36	8.94	0.14	--	--	--	--	--	--	--	--	--	33	6.8
18. Madhupatna-Kalyan Nagar Area	April	0.56	0.240	0.1	32.72	5.13	0.039	<0.002	0.008	0.00036	0.0003	0.006	0.010	0.006	0.037	0.887	<1.8	<1.8
	Oct	3.92	0.188	0.028	38.55	5.11	0.14	--	--	--	--	--	--	--	--	--	<1.8	<1.8
19. Badambadi Area	April	0.56	0.300	0.072	8.1	3.99	0.004	0.028	0.016	0.00013	0.0005	0.004	0.008	0.010	0.062	0.362	<1.8	<1.8
	Oct	4.76	0.202	0.007	33.6	16.17	0.12	--	--	--	--	--	--	--	--	--	<1.8	<1.8
20. Bidanasi-Tulsipur Area	April	1.68	0.330	0.056	5.22	1.85	0.011	<0.002	0.011	0.00006	0.0005	0.007	0.007	0.007	0.054	1.107	<1.8	<1.8
	Oct	4.76	0.155	0.022	11.37	2.01	0.09	--	--	--	--	--	--	--	--	--	<1.8	<1.8
6. Paradeep (JAGATSINGHPUR) (2 stations)																		
21. Musadiha	May	2.24	1.3	0.007	2010	56.5	0.133	0.002	0.008	<0.00006	0.0012	0.004	0.004	0.008	0.018	0.500	<1.8	<1.8
	Oct	12.32	0.504	0.047	280	16.8	1.00	--	--	--	--	--	--	--	--	--	<1.8	<1.8
22. Badapadia	May	0.056	0.69	0.019	625	43.2	0.081	<0.002	0.008	<0.00006	0.0016	0.004	0.004	0.007	0.021	0.400	<1.8	<1.8
	Oct	4.48	1.250	0.087	474.3	19.2	1.45	--	--	--	--	--	--	--	--	--	13	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/l	Fluoride, mg/l	PO_4^{3-}-P, mg/l	Sodium, mg/l	Potassium, mg/l	Boron, mg/l	Cr (VI), mg/l	Chromium Total, mg/l	Mercury ,mg/l	Cadmium, mg/l	Copper, mg/l	Lead, mg/l	Nickel, mg/l	Zinc, mg/l	Iron Total, mg/l	TC, MPN/ 100 ml	FC, MPN/ 100 ml
7. Sukinda (JAJPUR) (4 stations)																		
23. TISCO	April	1.12	0.200	0.498	12.09	4.63	0.007	<0.002	0.017	0.00006	0.0006	0.005	0.002	0.013	0.017	0.724	1600	540
	Oct	0.56	0.136	0.009	6.76	0.26	0.03	--	--	--	--	--	--	--	--	--	4.5	<1.8
24. Saruabil	April	0.56	0.170	0.031	14.8	3.76	0.011	<0.002	0.021	0.00025	0.0007	0.006	0.007	0.009	0.048	2.621	<1.8	<1.8
	Oct	2.8	0.186	0.022	16.71	3.34	0.01	--	--	--	--	--	--	--	--	--	<1.8	<1.8
25. Kaliapani	April	0.56	0.190	0.221	6.4	2.66	0.007	0.003	0.019	0.00025	0.0007	0.004	0.006	0.011	0.024	0.862	7.8	<1.8
	Oct	0.56	0.206	0.031	10.85	0.26	0.01	--	--	--	--	--	--	--	--	--	<1.8	<1.8
26. Kamarda	April	0.56	0.150	0.129	3.86	1.29	0.007	<0.002	0.017	0.00013	0.0009	0.006	0.005	0.009	0.051	5.324	<1.8	<1.8
	Oct	0.56	0.166	0.038	14.48	2.8	0	--	--	--	--	--	--	--	--	--	79	4.5
8. JHARSUGUDA (8 stations)																		
27. Thelkoi	April	0.56	0.390	0.014	7.16	1.89	0.011	<0.002	0.012	0.00019	0.0006	0.005	0.007	0.006	0.042	1.295	<1.8	<1.8
	Oct	0.28	0.220	0.137	54	4.55	0	--	--	--	--	--	--	--	--	--	<1.8	<1.8
28. Bhurkha-munda	April	0.56	0.440	0.002	8.86	2.77	0.018	<0.002	0.007	0.00006	0.0007	0.004	0.009	0.006	0.124	1.046	<1.8	<1.8
	Oct	6.72	0.157	0.092	23.62	4.21	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
29. Badamal Industrial Estate	April	0.56	0.420	0.007	10.68	4.11	0.004	0.003	0.011	0.00019	0.0006	0.011	0.009	0.008	0.105	0.739	<1.8	<1.8
	Oct	2.24	0.159	0.019	10.02	2.76	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
30. Budhipadar	April	1.12	0.430	0.005	10.9	3.65	0.021	0.003	0.011	0.00013	0.0004	0.016	0.009	0.006	0.050	0.163	<1.8	<1.8
	Oct	4.48	0.168	0.058	20.8	4.16	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
31. Brajara-jnagar Mining Belt	April	0.56	0.440	0.004	7.4	2.66	ND	<0.002	0.005	0.00051	0.0003	0.006	0.002	0.011	0.020	2.723	<1.8	<1.8
	Oct	1.68	0.210	0.098	19.11	5.98	<0.003	--	--	--	--	--	--	--	--	--	79	22
32. Rampur (water tank)	April	2.24	0.420	0.006	7.38	3.06	ND	<0.002	0.007	<0.00006	0.0005	0.007	0.004	0.009	0.009	0.071	<1.8	<1.8
	Oct	6.72	0.208	0.015	19.57	5.85	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
33. Ib thermal power station	April	1.12	0.510	0.001	15.66	5.45	0.042	0.003	0.02	0.00076	0.0004	0.003	0.005	0.008	0.019	1.709	540	240
	Oct	5.6	0.210	0.044	18.07	6.48	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
34. Belpahar Area	April	0.56	0.500	0.005	9.51	3.11	ND	<0.002	0.015	0.00032	0.0006	0.003	0.004	0.008	0.050	1.647	920	540
	Oct	5.6	0.208	0.016	78.5	8.24	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
9. PURI (4 stations)																		
35. Hospital-Bus stand-Mausima temple area	April	8.96	0.380	0.215	22.42	6.34	0.154	<0.002	0.011	0.00013	0.0006	0.005	0.004	0.004	0.034	3.131	<1.8	<1.8
	Oct	3.08	0.341	0.06	95.5	20.8	0.13	--	--	--	--	--	--	--	--	--	<1.8	<1.8
36. Near Jagannath Temple	April	1.12	0.290	3.394	94.5	14.1	0.249	0.002	0.008	0.00013	0.0008	0.005	0.003	0.006	0.069	1.974	<1.8	<1.8
	Oct	3.92	0.327	0.017	182.5	38	0.51	--	--	--	--	--	--	--	--	--	<1.8	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/l	Fluoride, mg/l	PO_4^{3-}-P, mg/l	Sodium, mg/l	Potassium, mg/l	Boron, mg/l	Cr (VI), mg/l	Chromium Total, mg/l	Mercury ,mg/l	Cadmium, mg/l	Copper, mg/l	Lead, mg/l	Nickel, mg/l	Zinc, mg/l	Iron Total, mg/l	TC, MPN/ 100 ml	FC, MPN/ 100 ml
37. Near Sea Beach	April	2.24	0.210	2.216	4210	260		0.007	0.018	<0.00006	0.0008	0.005	0.003	0.006	0.022	1.408	<1.8	<1.8
	Oct	4.48	0.311	0.014	426.5	70.5	0.19	--	--	--	--	--	--	--	--	--	13	<1.8
38. Baliapanda	April	7.84	0.340	0.366	45.6	9.43	0.119	<0.002	0.013	<0.00006	0.0006	0.004	0.004	0.008	0.055	0.627	<1.8	<1.8
	Oct	5.6	0.333	0.043	51.5	7.5	0.13	--	--	--	--	--	--	--	--	--	<1.8	<1.8
10. SAMBALPUR (3 stations)																		
39. Near Panthanivas	April	0.56	0.300	1.291	35.85	8.41	0.011	<0.002	0.007	0.00038	0.0007	0.008	0.010	0.003	0.097	7.181	<1.8	<1.8
	Oct	5.6	0.360	0.068	23.45	3.79	0.05	--	--	--	--	--	--	--	--	--	<1.8	<1.8
40. Near Railway station	April	0.56	0.290	0.007	131.8	12.61	0.014	<0.002	0.008	0.00044	0.0006	0.005	0.028	0.003	0.008	0.092	<1.8	<1.8
	Oct	2.24	0.329	0.028	100.2	4.81	0.16	--	--	--	--	--	--	--	--	--	<1.8	<1.8
41. Near VSS Medical College	April	0.28	0.290	0.113	44.49	10.74	0.007	<0.002	0.012	0.00025	0.0006	0.004	0.013	0.004	0.019	7.007	<1.8	<1.8
	Oct	2.24	0.172	0.097	48.8	7.63	<0.003	--	--	--	--	--	--	--	--	--	23	<1.8
11. TALCHER (7 stations)																		
42. Mahanadi Coal Field Area	April	0.28	0.440	1.623	18.8	5.49	0.025	<0.002	0.005	0.00013	0.0006	0.010	0.003	0.002	0.048	1.153	<1.8	<1.8
	Oct	3.92	0.116	0.001	42.15	9.99	0.26	--	--	--	--	--	--	--	--	--	<1.8	<1.8
43. Kaniha	April	1.12	0.500	0.177	9.2	3.81	0.06	<0.002	0.005	0.00013	0.0013	0.021	0.011	0.006	0.157	0.816	<1.8	<1.8
	Oct	2.24	0.237	0.005	48.3	1.8	0.07	--	--	--	--	--	--	--	--	--	<1.8	<1.8
44. Talcher town	April	0.56	0.540	0.084	105	8.81	0.144	0.003	0.007	0.00006	0.0020	0.038	0.012	0.018	0.254	1.224	<1.8	<1.8
	Oct	5.6	0.169	0.003	80.25	8.21	0.25	--	--	--	--	--	--	--	--	--	<1.8	<1.8
45. Meramun-dali Area	April	5.04	0.830	0.301	45.6	7.55	0.06	0.005	0.015	0.00006	0.0013	0.004	0.012	0.005	0.026	1.352	<1.8	<1.8
	Oct	3.36	0.985	0.011	74.7	1.66	0.15	--	--	--	--	--	--	--	--	--	<1.8	<1.8
46. Talcher Thermal Area	April	1.12	0.580	1.266	183.7	11.89	0.207	0.002	0.015	0.00032	0.0015	0.012	0.015	0.018	0.246	6.752	<1.8	<1.8
	Oct	7.84	0.717	0.003	147	2.16	<0.003	--	--	--	--	--	--	--	--	--	<1.8	<1.8
47. Banarpal	April	6.16	0.640	0.157	65.25	14.39	0.046	<0.002	0.012	0.00019	0.0017	0.005	0.015	0.008	0.007	0.959	<1.8	<1.8
	Oct	5.6	0.486	0.009	71.4	5.43	0.09	--	--	--	--	--	--	--	--	--	<1.8	<1.8
48. Kulad	April	0.28	1.700	0.076	49.25	7.28	0.098	<0.002	0.007	0.00013	0.0015	0.140	0.014	0.009	0.161	1.556	<1.8	<1.8
	Oct	7.28	1.530	0.006	62.4	8.71	0.06	--	--	--	--	--	--	--	--	--	<1.8	<1.8
Drinking water specification (IS : 10500 (2012)																		
Acceptable Limit		-	1.0	-	-	-	0.5	-	0.05	0.001	0.003	0.05	0.01	0.02	5.0	1.0	Absent	
Permissible limit		-	1.5	-	-	-	1.0	-	No relax	No relax	No relax	1.5	No relax	No relax	15.0	No relax	No relax	

5.7.2 Air Quality Status

5.7.2.1 National Ambient Air Quality Monitoring Programme (NAMP) & State Air Quality Monitoring Programme (SAMP)

The Board monitors ambient air quality at 36 stations in sixteen areas of the State under the CPCB assisted National Ambient Air Quality Monitoring Programme (NAMP) and one station under State Ambient Air Quality Monitoring Programme (SAMP) of the Board. Details of air quality monitoring stations, station type and parameters monitored are listed in Table-5.32. Four criteria parameters like Respirable Suspended Particulate Matter (RSPM) or PM_{10} (Particulate Matter having an aerodynamic diameter less than or equal to 10 µm), $PM_{2.5}$ (Particulate Matter having an aerodynamic diameter less than or equal to 2.5 µm), Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_2) are being regularly monitored at all stations. Beside these, Ammonia, Ozone & Lead are monitored at nine stations in Bhubaneswar, Puri and Konark. The monitoring is carried out for 24 hours (24-hourly sampling for $PM_{2.5,}$ 8-hourly sampling for PM_{10}, Pb & Ni, 4-hourly sampling for gaseous pollutants like SO_2 & NO_2 and one-hour sampling for NH_3 and O_3) with a frequency of twice in a week not in a conjugative day, to have a minimum of 104 observations in a year.

Table-5.32 Ambient Air Quality Monitoring Stations

Sl. No.	Name of the areas	Monitoring stations	Parameters monitored
1.	Angul	(i) RO, SPCB office building, Angul	PM_{10}, $PM_{2.5}$, SO_2 & NO_2
		(ii) NALCO Nagar, Angul	
2.	Balasore	(iii) RO, SPCB office building, Sahadevkhunta	
		(iv) DIC office, Angaragadia	
		(v) Rasalpur Industrial Estate	
3.	Berhampur	(vi) RO, SPCB office building, Brahmanagar	
4.	Bhubaneswar	(vii) SPCB office Building, Unit-VIII	PM_{10}, ,$PM_{2.5,}$ SO_2, $NO_{2,}$ $NH_{3,}$ O_3 &Pb
		(viii) I.R.C. Village, Nayapalli	
		(ix) Capital Police Station, Unit-I	
		(x) Chandrasekharpur	
		(xi) Patrapada	
		(xii) Palasuni water works	
5	Bonaigarh	(xiii) Bonai Govt. Hospital	PM_{10}, $PM_{2.5}$, SO_2 & NO_2
6.	Cuttack	(xiv) Traffic Tower, Badambadi	
		(xv) RO, SPCB office building, Surya Vihar	
		(xvi) PHED Office, Barabati	
7.	Jharsuguda	(xvii)RO, SPCB office building, Babubagicha,	
		(xviii) Inside TRL Colony Premises	
8	Kalinga Nagar	(xix) TATA Guest House	
		(xx) RO, SPCB Office building, Kalinganagar	
9	Keonjhar	(xxi) RO, SPCB Office building, Baniapat	

Sl. No.	Name of the areas	Monitoring stations	Parameters monitored
10	Konark	(xxii) Konark Police Station	PM_{10}, $PM_{2.5}$, NO_2, NH_3, O_3 &Pb
11	Paradeep	(xxiii) PPL Guest House	PM_{10}, $PM_{2.5}$, SO_2 & NO_2
		(xxiv) IFFCO STP	
		(xxv) PPT Colony	
12	Puri	(xxvi) Sadar Police Station	PM_{10},$PM_{2.5}$ SO_2, NO_2, NH_3, O_3 & Pb
		(xxvii) Town Police Station	
13	Rayagada	(xxviii) RO, SPCB Office building, Indiranagar	PM_{10}, $PM_{2.5}$, SO_2 & NO_2
		(xxix) Jakaypur	
14	Rajgangpur	(xxx) DISR, Rajgangpur	
15	Rourkela	(xxxi) RO, SPCB Office building, Sector-5	
		(xxxii) IDL Outpost, Sonaparbat	
		(xxxiii) IDCO Water Tank, IDC Kalunga	
		(xxxiv) Kuarmunda Out Post, Kuarmunda	
16	Sambalpur	(xxxv)PHED Office, Modipara	
17	Talcher	(xxxvi) TTPS, Talcher	
		(xxxvii) M.C.L., Talcher	

Ambient air quality status with respect to the four criteria parameters at these 37 stations in addition to three parameters like ammonia (NH_3), Ozone (O_3) and lead (Pb) at Bhubaneswar, Puri & Konark during the year 2018 are given in Table-5.33. The air quality of different cities/ towns have been compared with the national ambient air quality standards to assess the existing air quality status.

The annual average concentration of Respirable Suspended Particulate Matter (RSPM or PM_{10}) at all monitoring locations remained above the prescribed limit i.e., 60 µg/m^3 except at Regional Office building at Rayagada. Whereas, the annual average value of $PM_{2.5}$ remained within the limit of 40 µg/m^3 at 12 locations out of 37 monitoring locations. Percentage of violation of data for different parameters were calculated by comparing the 24-hourly average data of the parameters like SO_2, NO_2, NH_3 & Pb and one-hourly average data for O_3 with their respective 24-hourly average standard.

The range of PM_{10} violation varied within 0.95% to 98.1%. However, for $PM_{2.5}$, no violation occur at 04 places i.e., Capital Police station, Unit-1, Patrapada, Palasuni water works in Bhubaneswar and Regional Office building at Kalinganagar. The range of violation for $PM_{2.5}$ was from 0.95% to 84% . No violation of data for parameters like SO_2, NO_2, NH_3, Pb and O_3 was observed at all the monitored stations.

Air Quality Index (AQI)

AQI value of 17 areas during the year 2018 with prominent pollutant and categorization are given in Table-5.34. The range of AQI value, categorization and health impact are presented in Table-5.35. From the Table-5.34, it was observed that out of 17 areas, 08 areas are falling under Moderate category & 09 areas are falling under Satisfactory category. The prominent pollutant was PM_{10} in 15 areas and $PM_{2.5}$ in 02 area. The highest AQI value i.e., 127 w.r.t PM_{10} was been observed at Rajgangpur area and lowest in Berhampur i.e., 64.

Table-5.33 Ambient Air Quality Status of different cities & towns of Odisha during -2018

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 (1-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in Microgram per cubic meter)											
1	**Angul**													Satisfactory
	1. RO SPCB, Angul (I/E)	106	98 (45-154)	52 (18-85)	9.0 (BDL-19.9)	25.2 (15.6-34.6)	-	-	-	44.3%	33%	98 **(PM_{10})**	**100 (PM_{10})**	
	2. NALCO Nagar, Angul	107	102 (62-163)	46 (28-97)	9.6 (BDL-15.3)	25.2 (19.5-30.1)	-	-	-	60.7%	16.8%	101 **(PM_{10})**		
2	**Talcher**													Moderate
	3. TTPS , Talcher	105	95 (41-206)	46 (17-97)	10.2 (5.8-15.4)	28.3 (23.2-34.1)	-	-	-	37.1%	20.9%	95 **(PM_{10})**	**106 (PM_{10})**	
	4.MCL, Talcher	105	124 (54-182)	53 (23-86)	9.7 (4.8-11.6)	28.4 (21.7-33.9)	-	-	-	72.4%	36.2%	116 **(PM_{10})**		
3	**Balasore**													Satisfactory
	5. R.O, SPCB Sahadevkhunta	103	83 (65-144)	44 (30-95)	BDL (BDL-BDL)	10.8 (9.9-12.1)	-	-	-	0.97%	5.8%	83 **(PM_{10})**	**86 (PM_{10})**	
	6. DIC office, Angaragadia	103	83 (69-141)	43 (30-89)	BDL (BDL- BDL)	10.8 (10-13.8)	-	-	-	0.97%	2.9%	83 **(PM_{10})**		
	7.Rasalpur,Industrial Estate	103	91 (76-117)	55 (36-78)	7.7 (6.2-9.5)	11.8 (10.5-13.4)	-	-	-	11.6%	18.4%	92 **($PM_{2.5}$)**		
4	**Berhampur**													Satisfactory
	8. R.O, SPCB, Brahamanagar	103	64 (31-107)	33 (11-65)	BDL (BDL- BDL)	19.3 (14.8-25.1)	-	-	-	0.97%	0.97%	64 **(PM_{10})**	64 **(PM_{10})**	
5	**Bhubaneswar**													Satisfactory
	9. SPCB Office Building, Unit-VIII	88	98 (26-258)	38 (12-100)	BDL (BDL- 4.6)	20.1 (10.1-29.6)	48.1 (22.9-66.2)	23.4 (21.3-27.3)	0.015 (BDL-0.15)	55.7%	7.9%	**98 (PM_{10})**	**94 (PM_{10})**	

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 (1-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in Microgram per cubic meter)											
	10. I.R.C. Village, Nayapalli	83	89 (37-172)	34 (12-65)	BDL (BDL- 7.6)	19.6 (13.9-26.1)	52.8 (32.9-69.3)	24.1 (21.3-28.6)	0.017 (BDL -0.13)	44.6%	2.4%	89 **(PM_{10})**	**94 (PM10)**	
	11. Capital Police Station, Unit-I	92	105 (51-163)	31 (16-55)	BDL (BDL-5.3)	17.4 (BDL-32.7)	63.9 (30.6-97.9)	20.9 (BDL-32.7)	0.024 (BDL-0.106)	72.1%	NIL	103 **(PM_{10})**		
	12.Chandrasekharpur	93	93 (31-290)	31 (15-84)	BDL (BDL- 8.1)	15.4 (10.4-25.4)	41.9 (25.8-82.6)	23.5 (21.2-27.3)	0.024 (BDL -0.33)	37.6%	4.3%	93 **(PM_{10})**		
	13. Patrapada	100	90 (27-130)	26 (10-42)	BDL (BDL- BDL)	14.4 (10.8-22)	42.3 (BDL-57.1)	24.0 (20.8-29.0)	0.017 (BDL -0.11)	29%	NIL	90 **(PM_{10})**		
	14.Palasuni water works	80	89 (57-169)	27 (16-41)	BDL (BDL- BDL)	15.2 (BDL-26.0)	47.7 (30.3-86.7)	22.5 (BDL-34.0)	0.014 (BDL -0.075)	26.2%	NIL	89 **(PM_{10})**		
6	**Bonaigarh**													
	15. Roof of Bonai Govt. Hospital	106	99 (33-230)	36 (13-110)	8.4 (5.2-18.1)	12.0 (BDL-22.6)	-	-	-	38.7%	15.1%	99 (PM_{10})	99 (PM_{10})	**Satisfactory**
7	**Cuttack**												109 (PM_{10})	**Moderate**
	16. Traffic Tower Badambadi,	55	127 (83-180)	56 (42-73)	4.9 (BDL-5.5)	32.9 (26.7-38.3)	-	-	-	89.1%	34.0%	118 (PM_{10})		
	17. R.O.SPCB Building, Surya Vihar	104	106 (67-213)	45 (28-100)	BDL (BDL-5.9)	30.6 (25.5-42)	-	-	-	47.1%	18.7%	104 (PM_{10})		
	18.PHD office ,Barabati	104	106 (63-246)	44 (26-108)	BDL (BDL-7.1)	29.9 (25.2-36.8)	-	-	-	47.1%	24.0%	104 (PM_{10})		
8	**Jharsuguda**												104 (PM_{10})	**Moderate**
	19. RO Building,Cox Colony, Babubagicha,	107	105 (70-153)	55 (32-103)	10.1 (5.3-24.0)	18.0 (9.3-31.2)	-	-	-	75%	28%	103 (PM_{10})		
	20.Inside TRL Colony Premises	105	107 (78-139)	57 (35-86)	6.6 (BDL-11.2)	13.3 (9.8-22.2)	-	-	-	76.2%	41%	105 (PM_{10})		

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 (1-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in Microgram per cubic meter)											
9	Kalinga Nagar												122 (PM_{10})	Moderate
	21.Over the roof of Guest BRPL House(Near TATA Guest House)	98	124 (44-167)	71 (61-77)	BDL (BDL- BDL)	9.7 (BDL-12.7)	-	-	-	79.6%	84%	137 ($PM_{2.5}$)		
	22.Roof of RO SPCB, building	94	109 (39-191)	47 (36-60)	BDL (BDL- BDL)	11.7 (BDL-21.4)	-	-	-	77.6%	Nil	106 (PM_{10})		
10	Keonjhar												106 (PM_{10})	Moderate
	23. R.O.SPCB, Baniapat	75	109 (27-225)	49 (13-106)	BDL (BDL- BDL)	13.8 (9.8-20.6)	-	-	-	45.3%	33.3%	106 (PM_{10})		
11	Konark												80 (PM_{10})	Satisfactory
	24. Konark Police station	100	80 (36-197)	NM	BDL (BDL- BDL)	11.9 (9.5-17.2)	46.6 (20.2-71)	22.3 (BDL-27.2)	0.013 (BDL-0.08)	20.0%	NM	80 (PM_{10})		
12	Paradeep												113 (PM_{10})	Moderate
	25.PPL Guest House	98	114 (38-295)	36 (16-119)	18.7 (11.9-32.8)	11.4 (7.7-17.3)	-	-	-	46.9%	14.8%	109 (PM_{10})		
	26. On the roof of IFFCO STP	64	132 (43-248)	62 (33-102)	17.5 (12.2-26.3)	11.4 (8.8-19.3)	-	-	-	70.3%	43.7%	121 (PM_{10})		
	27. On the roof of Paradeep port trust	99	113 (36-317)	47 (16-161)	19.2 (13.8-37.8)	11.5 (9.1-20.6)	-	-	-	49.5%	26.8%	109 (PM_{10})		
13	**Puri**												**88 (PM_{10})**	Satisfactory
	28. Sadar police Station	66	88 (52-134)	NM	BDL (BDL- BDL)	14.6 (10.9-18.9)	54.1 (40.6-72.5)	22.6 (BDL-35.3)	0.012 (BDL-0.09)	21.2%	NM	88 **(PM_{10})**		
	29. Town police Station	84	87 (45-167)	NM	BDL (BDL- BDL)	14.9 (10.9-25.4)	52.2 (38.9-99.8)	23.2 (BDL-33.5)	0.02 (BDL-0.18)	17.8%	NM	87 **(PM_{10})**		

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 (1-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in Microgram per cubic meter)											
14	**Rayagada**													
	30.R.O.SPCB Building, Indiranagar	105	60 (27-161)	37 (11-118)	BDL (BDL- 18.7)	17.8 (13.8-31.2)	-	-	-	0.95%	0.95%	62 **($PM_{2.5}$)**	**66 ($PM_{2.5}$)**	**Satisfactory**
	31. LPS High School, Jaykaypur	105	66 (19-149)	42 (11-96)	BDL (BDL- 14.3)	18.5 (13.7-26.9)	-	-	-	0.95%	4.8%	70 **($PM_{2.5}$)**		
15	**Rajgangpur**												**127 (PM_{10})**	**Moderate**
	32. DISIR, Rajgangpur	106	140 (20-295)	47 (5-132)	15.3 (5.7-24)	19.6 (9.7-35.9)	-	-	-	77.3%	29.2%	**127 (PM_{10})**		
16	**Rourkela**												**106 (PM_{10})**	**Moderate**
	33. R.O.SPCB building, Sector-5	105	93 (51-187)	40 (14-267)	6.8 (BDL- 13.5)	13.5 (BDL-17.6)	-	-	-	14.3%	3.8%	93 **(PM_{10})**		
	34. IDL Outpost	105	85 (63-110)	50 (37-78)	5.9 (5.2-14.8)	10.8 (8.9-20)	-	-	-	7.6%	4.8%	85 **(PM_{10})**		
	35. IDCO Water Tank, IDC Kalunga	105	186 (93-359)	57 (27-93)	14.7 (BDL-25.5)	22.3 (4.5-34.6)	-	-	-	98.1%	37.1%	157 **(PM_{10})**		
	36. Kuarmunda Out Post, Kuarmunda	105	87 (30-184)	37 (20-66)	6.9 (BDL-15.1)	10.9 (BDL-20.8)	-	-	-	24.8%	0.95%	87 **(PM_{10})**		
17	**Sambalpur**													**Satisfactory**
	37. PHD Office, Modipara	105	84 (53-287)	52 (24-220)	4.7 (BDL- 39)	20.9 (15.7-42.8)	-	-	-	2.8%	18.1%	87 **($PM_{2.5}$)**	**87 ($PM_{2.5}$)**	
Prescribed Standard (24 hrly)			**100**	**60**	**80**	**80**	**400**	**180 (1Hourly)**	**0.5**					
Standard for Annual Avg. Value			**60**	**40**	**50**	**40**	**100**	**100 (8Hourly)**	**1.0**					

N.B: BDL- Below Detectable Limit, PM_{10} – Particulate Matter ≤ 10 µ size , $PM_{2.5}$ – Particulate Matter ≤ 2.5 µ size SO_2 – Sulphur Dioxide, NO_2 – Oxides of Nitrogen, NH_3 Ammonia, O_3 – Ozone & Pb-Lead, NM-Not Monitored

- BDL Value for $SO_2 \leq 4$ µg/m³, $NO_2 \leq 9$ µg/m³, $NH_3 \leq 10$ µg/m³, $O_3 \leq 10$ µg/m³, Pb ≤0.0022 µg/m³, $PM_{10} \leq 5$ µg/m³, $PM_{2.5} \leq 2$ µg/m³
- No percentage of violation of data from 24-hourly average for parameters like SO_2, NO_2, NH_3 & Pb and 1-hourly average data for O_3 at all monitored stations

Table-5.34 Annual Air Quality Index of Different monitored Stations in Odisha during the year, 2018

Monitoring Locations	Sub index value w.r.t parameter							Overall AQI of the area w.r.t parameter	Overall Categorisation
	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb		
1.Angul									
1.Industrial Estate	**100.0**	82.0	12.0	32.0	-	-		**100 (PM_{10})**	Satisfactory
2.NALCO Nagar									
2.Talcher									
3.TTPS , Talcher	**106.0**	83.0	12.0	35.0	-	-	-	**106 (PM_{10})**	Moderate
4.MCL, Talcher									
3.Balasore									
5.R.O, SPCB Sahadevkhunta	**86.0**	78.0	3.0	14.0	-	-		**86.0 (PM_{10})**	Satisfactory
6.DIC office, Angaragadia									
7.Rasalpur,I.E									
4.Berhampur									
8.R.O, SPCB, Brahamanagar	**64.0**	55.0	3.0	24.0	-	-	-	**64.0 (PM_{10})**	Satisfactory
5.Bhubaneswar									
9.SPCB Office Building, Unit-VIII	**94.0**	52.0	3.0	21.0	12.0	23.0	1.8	**94.0 (PM_{10})**	Satisfactory
10.I.R.C. Village, Nayapalli									
11.Capital PS Unit-I									
12.Chandrasek-harpur									
13.Patrapada									
14.Palasuni water works									
6.Bonaigarh									
15.Bonai Govt. Hospital	**99.0**	60.0	11.0	15.0	-	-	-	**99.0 (PM_{10})**	Satisfactory
7.Cuttack									
16.Traffic Tower Badambadi,	**109.0**	80.0	3.0	39.0	-	-	-	**109.0 (PM_{10})**	Moderate
17.R.O.Building, Surya Vihar									
18.PHD office ,Barabati									
8.Jharsuguda									
19.RO Building,Cox Colony,Babubagicha,	**104.0**	93.0	10.0	20.0	-	-	-	**104.0 (PM_{10})**	Moderate
20. Inside TRL Colony Premises									
9.Kalinganagar									
21.Over the roof of BRPL Guest House(Near TATA Guest House)	**122.0**	98.0	3.0	13.0	-	-	-	**122.0 (PM_{10})**	Moderate
22.Roof of Regional Office Building,									
10.Keonjhar									
23.R.O, Baniapat	**106.0**	82.0	3.0	17.0	-	-	-	**106.0 (PM_{10})**	Moderate

Monitoring Locations	Sub index value w.r.t parameter							Overall AQI of the area w.r.t parameter	Overall Categorisation
	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb		
11.Konark									
24.Konark Police Station	**80.0**	NM	3.0	15.0	12.0	22.0	1.3	**80.0 (PM_{10})**	Satisfactory
12.Paradeep									
25.PPL Guest House	**113.0**	80.0	23.0	14.0	-	-	-	**113.0 (PM_{10})**	Moderate
26.On the roof of IFFCO STP									
27.On the roof of Paradeep port trust									
13.Puri									
28. Sadar police Station	**88.0**	NM	3.0	18.0	13.0	23.0	2.0	**88.0 (PM_{10})**	Satisfactory
29. Town police Station									
14.Rayagada									
30. RO Building, Indiranagar	**63.0**	66.0	3.0	23.0	-	-	-	**66.0($PM_{2.5}$)**	Satisfactory
31. LPS High School, Jaykaypur									
15.Rajgangpur									
32. DISR Rajgangpur	**127.0**	78.0	19.0	25.0	-	-	-	**127.0 (PM_{10})**	Moderate
16.Rourkela									
33.Regional Office Building, Sector-5	**106.0**	77.0	11.0	18.0	-	-	-	**106.0 (PM_{10})**	Moderate
34. IDL Outpost									
35. IDCO Water Tank, IDC Kalunga									
36. Kuarmunda Out Post, Kuarmunda									
17.Sambalpur									
37.PHD Office, Modipara	84.0	87.0	6.0	26.0	-	-	-	**87.0 ($PM_{2.5}$)**	Satisfactory

Table-5.35 AQI range with categorization and Health impact

AQI VALUE	CATAGORY	IMPACT ON HUMAN HEALTH
0-50	GOOD	Minimal Impact
51-100	SATISFACTORY	Minor breathing discomfort to sensitive people
101-200	MODERATE	Breathing discomfort to the people with lung, heart disease, children and adults
201-300	POOR	Breathing discomfort to people on prolonged exposure
301-400	VERY POOR	Respiratory illness to the people on prolonged exposure
>401	SEVERE	Respiratory effects even on healthy people

5.8 INDUSTRIAL INSPECTIONS, MONITORING OF WATER, AIR AND SOLID WASTE SAMPLES

The Board has analysed following samples. The status of inspection and monitoring during the year 2018-19 is given in Table-5.36.

Table - 5.36 Inspection and Monitoring of Water, Air and Solid Waste

Nos. of Inspec-tions	Samples under NWMP, SWMP & NRCP	Nos. of Industrial samples	Nos. of other water samples	Nos. of Soil/solid waste/ Plant samples	Nos. of Stack emission samples	Ambient Air Quality studies			Ambient Noise
						Industrial premises	SAMP / NAMP	Others	
5877	4171	2494	1474	48	1013	1652	11,325	269	753

5.9 PUBLIC GRIEVANCES

The status of various public complaints received and redressed on following matters during 2018-19 is given in Table 5.37.

- 17 categories of highly polluting industries
- Disposal of hazardous chemicals and hazardous wastes
- Stone crusher
- Brick Kiln
- Other industries
- Mines
- Iron Crushers
- Public nuisance
- Other miscellaneous issues

Table - 5.37 Status of Public Complaints

No. of complaint received	Disposal	Under investigation
576	351	225

5.10 IMPLEMENTATION OF RIGHT TO INFORMATION ACT, 2005

The Right to Information Act, 2005 provides for setting out the practical regime of right to information for citizens to secure access to information under the control of Public Authorities (P.A), in order to promote transparency and accountability in the working of every public authority.

According to Section 6 of this Act, any person who desires to obtain any information under this Act can apply in Form A specifying the particulars of the information sought by him or her in writing or electronically in English or in local official language. The application should be accompanied with the requisite fee, prescribed under the Act.

As per the Act, the State Pollution Control Board, Odisha is providing available information as and when sought through proper application. Mrs. Kainta Tudu, Env. Scientist of the Board has been declared as the Public Information Officer under the provisions of the Act. 603 no. of requests were received under RTI during 2018-19 (Table-5.38). The total amount collected for RTI requests during 2018-19 is ₹ 11,739/- .

Table - 5.38 Status of Applications under RTI Act

SL. No.	Details of the Application	Nos.
01.	Total no. of applications received	603
02.	No. of applications on which Information provided	531
03	No. of applications on which request rejected	34
04.	No. of requests transferred to other public Authorities	30
05.	No. of applications under evaluation	08

CHAPTER - VI

LEGAL MATTERS

6.1 STATUS OF LEGAL CASES

The Board initiates legal action against those units which fail to adopt adequate pollution control measures entailing violation of norms and directives, in spite of repeated persuasion and after having received adequate opportunity.

The Board has filed/counter filed 331 cases and 247 cases have been disposed off by the respective Courts during 2018-2019. The details of cases filed by the Board alongwith the status of public interest litigations and writ petitions filed in different Courts are presented in Table-6.1.

Table - 6.1 Details of Cases Filed by the Board

Sl. No	Name of the Court	No. of Cases	
		Filed/Counter filed	**Disposal***
A	**Lower Court (SDJM)**		
1.	The Water (PCP) Act	Nil	Nil
2.	The Air (PCP) Act	Nil	Nil
3.	The Environment (Protection) Act	Nil	Nil
B	**High Court**		
1.	PIL	07	14
2.	Writ	226	165
C	**Supreme Court**		
1.	PIL	02	Nil
2.	Writ	04	01
D	**Other Court**		
1.	Civil Suit	Nil	Nil
2.	Consumer Dispute Cases	Nil	Nil
3.	Lokpal Cases	Nil	Nil
4.	N.H.R.C. / O.H.R.C.	33 (NHRC-23+ OHRC-10)	30 (NHRC-17+ OHRC-13)
5.	Cases U/S-133 of CrPC	Nil	Nil
6.	Cases before the State Appellate Authority	05	04
7.	Cases before the National Green Tribunal	52	33
8.	Misc. Cases	02	Nil
	Total	**331**	**247**

N.B: *Include cases carried over from the previous years

CHAPTER - VII

FINANCE AND ACCOUNTS

The estimated and the actual receipts during 2018-19 are given in Table-7.1.

Table-7.2 reflects the details of budget provision and actual expenditure incurred during the year 2018-19.

Table - 7.1 Receipt of the Financial Year 2018-19 (Rupees in lakhs)

Sl No.	Head of Receipt	Estimated Receipt	Revised Receipt	Actual Receipt
(A)	**Boards Own Receipt**			
1	**Consent to operate fees**			
	a) CTO current year			292.42
	b) CTO in Advance			4686.21
	Total CTO fees	2260.00	2768.13	4978.63
2	Consent to Establish	510.00	835.00	1092.50
3	Misc.Receipt	6.00	4.55	6.67
4	Analysis Charges	1.00	1.00	1.11
6	Recovery of Loan & Others	50.00	40.00	31.08
7	Public Hearing fees	17.00	26.75	26.50
8	Hazardous Waste Auth	15.00	15.70	31.24
9	Aut.Bio.Med.Fees, E-waste	15.00	17.00	24.83
10	Interest on Savings/Advances	2000.00	2000.00	1278.52
	Sub-Total	**4874.00**	**5708.13**	**7471.08**
11	Pollution Charges	2.00	9.00	8.60
12	Forfeiture of Bank Guarentee	5.00	7.00	5.70
13	Penalty/Env.Compensation/Hotels and Brick Klins			30.95
	Sub-Total	**7.00**	**16.00**	**45.25**
(B)	**Water Cess(Reimbursement)**	800.00	800.00	21.49
(C)	**Receipt of Scheme**	310.23	456.08	479.68
	Sub-Total	**1110.23**	**1256.08**	**501.17**
	Grand Total	**5991.23**	**6980.21**	**8017.50**

Table - 7.2 Expenditure during the Financial Year 2018-19 (Rupees in lakhs)

Sl No.	Source of Funding	Head of Account	Budget for 2018-19	Revised Budget for 2018-19	Actual Expenditure
1	**Boards Own Fund**	i)Salary	3817.00	3894.50	3325.36
		ii)Recurring Exp.	518.00	615.67	427.19
		iii)Non Recurring	286.00	421.30	122.01
		iv)Loan & Advances	42.00	43.80	32.13
		Transfer of fund to OEMFT	7.00	16.00	65.60
		Total	**4670.00**	**4991.27**	**3972.29**
2	**Water Cess Fund**	i)Salary of Scientific & Technical Personnel	150.00	150.00	150.00
		ii)Establishment Cost & Office Operation	137.50	139.00	70.25
		iii)E-governance & IT Operations	61.00	61.00	4.20
		iv)Monitoring of Air,Water,Noise Quality etc	143.00	146.00	49.74
		v) Other project activities	482.00	210.00	84.62
		Total	**973.50**	**706.00**	**358.81**
3	**Sponsored Scheme**		**319.43**	**578.20**	**468.43**
		Grand Total	**5962.93**	**6275.47**	**4799.53**
4	**Others**	Deposit of Income Tax			**1000.00**
		SPCB Pension Fund Trust			**795.00**

CHAPTER - VIII

OTHER IMPORTANT ACTIVITIES

8.1 INTEGRATED COASTAL ZONE MANAGEMENT PROJECT (ICZMP)

Coastal Water Monitoring and Analysis has been made regularly since April 2014 on quarterly/ seasonal basis by the PEA from the assigned monitoring area i.e. from Paradeep (20˚10'02.67˝N; 86˚31'22.63˝E) to Dhamra coast ($20^0$5'58.96N; $86^0$58'12.27E), covering nearly 80 KM in the sea. All samplings have been made from on-shore and off-shore sampling points with the help of trawler as well as monitoring vessel (MV Sagar Utkal). As given in the protocol, seventy three (73) sampling locations have been selected for the entire monitoring area (Mahanadi transect-32 points, Dhamra transect-17 points and Gahirmatha-Bhitarkanika transect- 24 points).

The details of monitoring conducted during 2018-19 by the PEA are given in table below.

Table- 8.1

Year/ Monitoring Quarter	Period	Duration of sampling	No. of Water samples collected	No. of Sediment samples collected
2018-19/Q3	October-November	November-2018	478	27
2018-19/Q4	December-February	January-2019	192	18
2018-19/Q4	December-February	February-2019	120	9
2018-19/Q1	March-June	March-2019	321	23
			Total: 1111	77

Parameters analysed for the water samples include *pH, Conductivity, Total Suspended Solids, Total Dissolved solids, Turbidity, Fluoride, Dissolved Oxygen, Biochemical Oxygen Demand, Alkalinity, Salinity, Nitrite, Nitrate, Ammonia, Silicate, Ortho-phosphate, TOC, TIC , heavy metals(V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Mo, Pb, Cd, Hg),Total Coliform, Fecal Coliform, Chlorophyll-a, Chlorophyll-b, Chlorophyll-c, Total Chlorophyll, Phaeophytin pigment, Carotenoid, Phytoplankton and Zooplankton.*

Parameters analysed for the sediment samples include *pH, TOC, TIC, heavy metals, Macro Benthos, Meio Benthos and sediment composition i.e, sand, silt and clay.*

Some photographs during sampling in vessel are given below:

Blue Flag Beach Certification of Beach along coastal stretch of Odisha:

As per Blue Flag standards, a beach must be plastic-free and equipped with a waste management system. Clean water shall be available for tourists, apart from international amenities. The beach shall have facilities for studying the environmental impact around the area.

The drive for the Blue Flag certification; which is the tag given to environment-friendly and clean beaches, equipped with amenities of international standards for tourists; has been initiated for a few coastal stretches in the State of Odisha. In this connection, twelve more beaches in the country are being developed by the Society for Integrated Coastal Management (SICOM), which is the Environment Ministry's body working for the management of coastal areas in accordance with the Blue Flag standards. As per the proposal of Govt. of Odisha and MoEF & CC, GoI; the OSPCB has been involved in conducting detail survey of environmental status of the coast as desired.

In addition to Chandrabhaga beach, four new beach i.e., two at Puri and two at Paradeep were identified for Pilot Blue Flag Beach. Monitoring in confirmWation of bathing water quality as per the FEE guidelines was employed during the study of these stretches. 120 water samples from Puri Sea Beach at ten different locations and 60 water samples from Paradeep Sea Beach at ten different locations have been collected, analyzed & reported.

Total 246 water samples were collected, analysed and reported for sampling made in two phases i.e., from April to June and from September to November from six different locations in Chandrabhaga beach. As per FEE Guidelines, parameters those were analyzed for the water samples include *Colour, Odour, pH, Turbidity, Dissolved Oxygen, Biochemical Oxygen Demand, Fecal Coliform, Fecal Streptococci and Oil & grease* for all samples.

Monitoring at Puri Beach

Monitoring at Paradeep Beach

Monitoring at Chandravaga Beach

Training and Workshop attended (ICZMP, SPCB, Odisha)

1. Mrs. Sumitra Nayak, AES attended BRNS-AEACI Thirteenth School on Analytical Chemistry (SAC-13) from 23rd to 30th April, 2018 at Department of Hydro & Electrometallurgy, CSIR-IMMT Bhubaneswar, Odisha.
2. Dr. S.S.Pati, AES attended the training on 'Taxonomical Identification of Macro Invertebrate in Biological testing' from 4th Oct to 6th Oct, 2018 at NEERI, Nagpur.
3. Dr.S.Mishra, AES attended training on 'Biological Monitoring analysis and Testing (Microbiology, bioassay and Bio monitoring), SOPs, data Interpretation and Quality Assurance' from 20th Nov to 22nd Nov, 2018 at Punjab University, Chandigarh, Punjab.
4. Mr. Sarat Kumar Mohanty, SSA attended training programme on "Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting - Hands-on-Training and Case Study" from February 4th to 6th , 2019 at Indian Statistical Institute, SQC & OR Unit, Delhi Centre.

Other Activities of ICZMP, SPCB, Odisha:

1. Vigilance awareness week was observed at Coastal Laboratory on 29th October, 2018 with the officials and staffs of Central Laboratory, Bhubaneswar and Regional Office, Bhubaneswar.
2. Few students of Banki Autonomous College visited CMCE Office for studying & understanding the detail methodologies for sampling, procedure for preservation and analysis of marine water and sediment samples. Necessary demonstration was imparted on sampling methodologies for physico-chemical, biological parameters for water and sediment by the scientists of ICZMP, SPCB, Odisha in association with Regional Office, Paradeep.

3. M/s AFC India Ltd, New Delhi; the Third party monitoring and evaluation consultant for ICZM project as appointed by SICOM, visited CMCE, Paradeep on dt.31.10.2018.

8.2 FLY ASH RESOURCE CENTRE (FARC)

Fly Ash Resource Centre (FARC) is working in the Board since June'2013 as per the decision of High Level Committee, Chaired by the Chief Secretary, Govt. of Odisha. During the financial year 2018-19 about 31.24 Million Tonne of fly ash has been generated, out of which the utilisation of fly ash is about 25.84 Million Tonne i.e 82.71%.

The mandate of the FARC is to facilitate & enhance the utilisation of fly ash in the State by facilitating and exploring various options such as brick manufacturing, cement and asbestos manufacturing, quarry filling, coal mine void filling, dyke raising, land development and road making etc. The Board has also taken up awareness from time to time among the stakeholders. FARC has prepared the following guidelines and uploaded in the Board's website.

a. Guidelines for Manufacturing of Quality Fly Ash Bricks
b. Guidelines for Low lying area filling with fly ash
c. Guidelines for Use of Fly ash Tiles in canal lining
d. Best Practices in Fly ash utilization
e. Fly ash in Road construction

8.3 UNIDO-GEF-Funded MoEF Project On Biomedical Waste Management

Odisha has been identified, as one of the five States in the Country (Other States are Maharashtra, Gujarat, Punjab, Karnataka) for implementing UNIDO-GEF-Funded MoEF Project on Biomedical Waste Management. SPC Board has been designated by the Govt. as the Nodal Agency and the Board has signed the contract with UNIDO. The project is implemented in 28 Health Care Establishments (HCEs) and one district (Sambalpur) as model project including three Govt. Medical College and Hospitals. Govt. of Odisha is also co-financing the project.

The achievements of the project in implementing best BMW management in the State are as follows :

- Dedicated manpower (Project Officers) in 9 Govt. hospitals and State Biomedical Waste Cell of Health and Family Welfare Dept., Govt. of Odisha has been provided exclusively to deal with Bio-medical Waste Management.
- After deployment of Project Officers, regular training imparted to waste handlers and regular surveillance and the Bio-medical Waste Management practice in the aforesaid 9 HCEs has been improved considerably, particularly the practice of segregation of bio-medical wastes.
- Colour-coded bins (3360 nos.) and waste collection trolleys (241 nos) have been provided to the identified 28 HCEs.
- Capacity building of Medical Officers, Nurses, Paramedical Staff, Waste Handlers and related stakeholders.
- Seven workshops have been conducted throughout the State and the participants were Doctors, Nodal Officers, Paramedical Staff, Nurses and Waste Handlers.
- Standard Operating Procedure(SOP) and Training Manuals, prepared by MS Ramaiah Medical College, Bangalore have been distributed to the Board, Health and Family Welfare Department, CBWTF and all identified HCEs.
- Microwaves have been provided to 4 nos. of large medical college and hospitals namely SCB Medical College and Hospital, Cuttack; VIMSAR, Burla; MKCG Medical College and Hospital, Berhampur; and SUM Hospital, Bhubaneswar under the project.

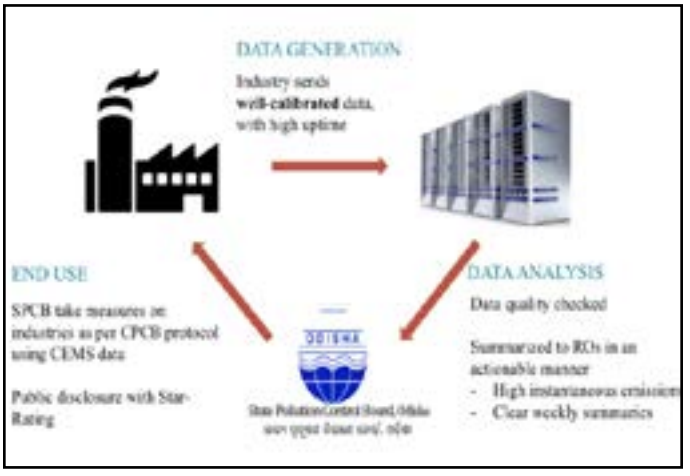
8.4 EPIC- OSPCB PARTNERSHIP PROJECT

- Govt. of Odisha had signed a Statement of Intent (SoI) with University of Chicago on 3rd April 2017. As a part of the partnership with Govt. of Odisha, Energy Policy Institute at the University of Chicago (EPIC-India) has set up a knowledge cell w.e.f. 1st May 2017 within the head office of Odisha State Pollution Control Board (OSPCB) and researchers are currently working with OSPCB in improving environmental regulation.
- EPIC-India have developed a Star Rating Portal for information disclosure on data transmitted through CEMS.
- Through Government- Academic partnership cutting edge research and advanced analytics tools are developed for better enforcement and compliance monitoring of industries.

Energy Policy Institute at the University of Chicago (EPIC) India and State Pollution Control Board, (SPCB), Odisha Partnership Project.

i) **Launching of Star Rating Programme :**

For the 1st phase of Star Rating rollout, 20 industries from different sectors had been chosen and their PM-CEMS were calibrated and validated in presence of Board officials.



(Calibration and Validation of Data from PM-CEMS for 1st Phase 20 Industries)

The Star Rating Programme has been launched by Honorable Chief Minister of Odisha Shri Naveen Patnaik on 17th September 2018 at Odisha Secretariat by unveiling a new website (www.ospcb.info) where citizens can access the information. Hon'ble Chief Minister also appreciated the efforts of State Pollution Control Board, Odisha quoting this initiative as an excellent example of **3Ts- Technology, Teamwork and Transparency**

The Star Rating Launch programme was attended by Hon'ble Minister, Forest and Environment, Shri Bijayshree Routray, Hon'ble Minister for Industries, Shri Anant Das, Chief Secretary, Shri Aditya Prasad Padhi, Development Commissioner cum Chairman, Shri R Balakrishnan, ACS Forest & Environment, Shri Suresh Chandra Mahapatra, Director Environment, Dr. K Murugesan, Member Secretary SPCB Odisha, Shri Debidutta Biswal, Dr. Akhila Kumar Swar, Chief Environmental Engineer cum Nodal Officer of Star Rating Programme, Senior Officials from SPCB Odisha, delegates from University of Chicago (EPIC India) and representatives from 20 industries of Odisha.

(Star Rating Launch by Hon'ble Chief Minister of Odisha on 17th Sept 2018 at Bhubaneswar)

Meanwhile, EPIC-India team have developed a dedicated web portal named as **ospcb.info** that has been linked to main page of Odisha State Pollution Control Board **ospcboard.org** to display the monthly rating of industries. The website has been designed in a user-friendly manner both in English as well as Odia language.

ii) **Workshop on CEMS and Star Rating Program for Industries:**

SPCB, Odisha along with Energy Policy Institute at University of Chicago (EPIC-India), conducted a full day workshop for all 17-Categories of highly polluting industries of Odisha on CEMS and Star Rating Program on 13th November, 2018 at Hotel Swosti Premium, Bhubaneswar (Odisha). This Workshop was conducted to discuss with all stakeholders on CEMS regulations, calibration and creating awareness on new protocols issued by regulators to improve the data quality and availability. This will lead to greater transparency and larger participation of industries into the Star Rating program. SPCB, Odisha invited some eminent speakers from Centre for Science and Environment, Industry Representative, Scientist and Researchers from other SPCBs (Gujarat) to share their experience and knowledge on CEMS guidelines, protocols, calibration as well as field experience on data validation and monitoring of analysers.

The Workshop was chaired by Shri R Balakrishnan, DC cum Chairman of OSPCB. The Workshop was attended by about 179 participants from 17 Category Industries and 50 officials from SPCB Odisha including representatives from its 12 Regional Offices.

(CEMS and Star Rating Workshop on 13th Nov 2018 at Bhubaneswar, Odisha)

As on March 2019, a total of 90 Industries under 17 category completed calibration and data validation of their PM-CEMS. All these industries have been included in the Odisha Star Rating Programme.

iii) **Strengthening IT Infrastructure of SPCB, Odisha**

- SPCB, Odisha have introduced a centralized monitoring and IT-Cell at the Head Office of the Board to strengthen its vigil mechanism and analysis of RT-DAS data.
- Also, monitoring happens at decentralized manner at Regional Office level by creating a pool of dynamic staff through additional capacity building.
- A more robust IT-Infrastructure and Control Centre is in pipeline which will provide advanced real-time monitorinWg through digitization of CEMS data.
- EPIC India has been supporting SPCB, Odisha in strengthening the IT Infrastructure and developing data analytics and monitoring reports for creating a robust regulatory mechanism through command and control.

8.5 OBSERVATIONS DURING DIFERENT FESTIVALS

8.5.1. Impact of Festive Activities during Dashera and Deepawali on Noise level and Ambient Air Quality (AAQ) of selected towns and cities of Odisha.

State Pollution Control Board, Odisha has taken pro-active measures to create public awareness on ill-effect of noise and bursting of fire crackers by publishing public notices in two Odia and two English newspaper on dated 13.10.2018.
The Board has conducted monitoring of Noise Level in pre- and during- Dashera festival in 13 towns/cities and in pre- and during- Deepawali at 14 towns/cities of the State to assess the impact of noise and bursting of fire crackers. The Board also conducted ambient air monitoring with respect to PM_{10}, $PM_{2.5}$, SO_2 & NO_2 in 16 towns/cities to assess the impact on ambient air quality during these occasions.
The findings of the monitoring are summarized below and results are presented in Table-8.2 and Table-8.3.

IMPACT OF DASHERA CELEBRATION ON AMBIENT NOISE LEVEL

The Board has conducted ambient noise monitoring at 49 locations in 13 towns/cities i.e Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Paradeep, Puri, Rayagada, Rourkela and Sambalpur covering Industrial, Commercial, Residential and Silence zone during day and night time in pre & during Dashera to assess the impact of Dashera festival on the ambient noise level. Out of these 49 locations, 10 locations are in Industrial zone, 13 locations are in commercial zone, 13 locations are in residential zone and 13 locations are in silence zone. The findings of the monitoring are summarized below and results are presented in Table-8.2.

I. Industrial Zone

The noise level at all locations in pre & on the day of Dashera are below the prescribed limit for day time i.e., *75 dB (A)* Leq *except at two locations during Dashera day at Khapuria Industrial Estate ,Cuttack & Kalinga nagar Industrial Estate, Jajpur.*
During night time the noise level are below the limit i.e., 70 dB (A) Leq *at all locations in pre & on the day of Dashera except at two locations on the day of Dashera i.e., Bombay chowk, Jharsuguda and Khapuria Industrial Estate, Cuttack.*

II. Commercial Zone

The noise level in day time on pre & during Dashera at all locations are above the limit i.e., 65 dB (A) Leq except at one location in pre period at Gole bazar, Sambalpur i.e., 60.3 dB (A) Leq. The maximum noise occurred at Motiganj, Balasore i.e., 83.9 dB (A) Leq on the day of Dashera. The noise level in night time exceed the limit i.e.,55 dB (A) Leq at all locations in pre & on the day of Dashera. The maximum noise level occurred i.e 87.8 dB (A) Leq at Motiganj, Balasore.

III. Residential Zone

The noise level at the day time exceed the limit i.e. 55 dB (A) Leq in both pre & during Dashera at all locations except at one location in pre i.e., at Sector 19, Rourkela. The maximum noise level occurred at Paradeep Port Trust colony, Pardeep i.e.,78.6 *dB (A) Leq in day time on the day of Dashera.*

During night time noise level in pre & during Dashera are more than the limit i.e.,45 dB (A) Leq at all locations except at one location in pre period i.e., sector 19,Rourkela.The maximum noise level occurred i.e., 84.4 dB (A) Leq at Cox colony, Jharsuguda during Dashera at night time .

IV. Silence Zone

The noise level in day time & night time at all locations are above their respective limit i.e., 50 dB (A) Leq for day time & 40 dB (A) Leq for night time except at one location i.e., IGH Steel Township, Rourkela both in pre & on the day of Dashera. Maximum noise level i.e., 84.9 dB (A) Leq in day time & 86.3 dB (A) Leq in night time at District Head Quarter Hospital, Jharsuguda are observed on the day of Dashera.

Table-8.2 Noise level in dB(A) Leq at different locations on pre and on Dashera day during the year 2018

Sl. No	Towns/Cities	Monitoring Locations	Pre- Dashera		During-Dashera	
			D	N	D	N
1.	Angul	1.Amalapada(R)	62.7	55.1	68.0	54.1
		2.Bazar chhak(C)	65.6	58.2	82.8	59.9
		3.District Head Quarter Hospital(S)	60.5	53.1	62.9	51.6
		4.Hakimpada(I)	61.3	55.5	64.2	55.8
2.	Balasore	5.Sahadevkhunta(R)	55.0	46.6	64.5	68.8
		6.Motiganj Bazar(C)	73.7	59.8	83.9	87.8
		7.District Head Quarter Hospital(S)	54.8	40.8	52.9	57.4
		8.Balasore Industrial Estate(I)	52.1	44.9	61.0	50.0
3.	Berhampur	9.Brahmanagar(R)	58.0	50.7	65.3	53.2
		10.Girija market square(C)	76.3	66.6	76.3	78.9
		11.MKCG Medical & Hospital(S)	52.3	50.4	54.6	49.8
		12.Ankuli(I)	65.2	58.4	65.5	61.7
4.	Bhubaneswar	13.Nayapalli(R)	68.8	69.0	77.2	73.0
		14.Sahidnagar(C)	72.0	58.4	61.8	69.0
		15.Capital Hospital(S)	53.9	59.6	60.6	56.3
		16.Rasulgarh(I)	67.4	62.9	71.4	61.5
5.	Cuttack	17.Suryavihar(R)	72.3	64.4	77.7	72.2
		18.Badambadi(C)	73.6	73.7	81.8	77.7
		19.SCB Medical College & Hospital(S)	67.9	60.6	77.4	71.1
		20.Khapuria(I)	71.9	72.8	76.2	73.4
6.	Jharsuguda	21.Cox Colony(R)	68.0	63.8	76.5	84.4
		22.Jhanda Chowk(C)	69.3	64.0	77.2	80.2
		23.District Head Quarter Hospital(S)	73.5	62.5	84.9	86.3
		24.Bombay Chowk(I)	72.3	61.6	74.0	87.7
7.	Kalinganagar	25.Sapagadia(R)	67.7	59.1	65.7	NM
		26.Gopabandhu Chowk(C)	78.2	67.2	76.8	NM
		27.CHC Hospital, Jajpur Road(S)	59.5	60.8	61.8	66.5
		28.Kalinganagar Industrial Estate(I)	62.9	67.9	77.1	NM

Sl. No	Towns/Cities	Monitoring Locations	Pre- Dashera		During-Dashera	
			D	N	D	N
8.	Keonjhar	29.Baniapat Chowk(R)	66.7	56.7	70.9	58.0
		30.Punjabi Chowk(C)	76.0	69.6	74.9	81.7
		31.Govt.Hospital(S)	63.6	62.6	68.1	57.2
9.	Paradeep	32.PPT Colony(R)	66.7	66.1	78.6	77.6
		33.LIC Building Jagatsinghpur(C)	75.9	58.8	82.3	77.0
		34.District Head Quarter Hospital(S)	58.1	66.6	68.6	66.9
10.	Puri	35.Kumutisahi, Old Sadar lane(R)	68.1	55.8	74.3	65.5
		36.Sri Mandir(C)	76.1	64.4	78.6	65.1
		37.District Head Quarter Hospital(S)	64.8	56.2	63.9	62.2
11.	Rayagada	38.Irregation colony jeypore(R)	65.3	58.6	70.8	62.9
		39.Near SBI brancj Jeypore(C)	78.6	73.1	81.8	75.1
		40.HDS Jeypore(S)	68.8	71.0	75.3	67.0
		41.Bilt Jeypore(I)	66.6	67.2	68.5	73.0
12.	Rourkela	42.Sector-19(R)	51.3	43.8	56.8	52.9
		43.Bisra Chowk(C)	72.5	61.3	74.3	65.7
		44.IGH steel Township(S)	46.4	37.9	46.9	30.0
		45.RSPL Sail(I)	68.9	67.0	71.1	68.1
13.	Sambalpur	46.Ainthapali(R)	56.4	47.5	64.3	63.1
		47.Golebazar(C)	60.3	58.9	72.5	67.5
		48.District Head Quarter Hospital(S)	58.1	49.3	68.3	56.2
		49.Bareipali(I)	59.7	61.4	61.6	69.4

Ambient Noise Standard (In Leq dB(A))

Category of area zone	Day Time	Night Time
Industrial area(I)	75	70
Commercial area(C)	65	55
Residential area(R)	55	45
Silence area(S)	50	40

N.B:- D-Day Time monitoring period (6PM to 10PM), N-Night Time monitoring period (10PM to 12.00 AM) NM-Not Monitored

IMPACT OF DEEPAWALI CELEBRATION ON AMBIENT NOISE LEVEL

The Board has conducted ambient noise monitoring at 53 locations in 14 towns/cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur town/cities covering Industrial, Commercial, Residential and Silence Zone in the day and night time to assess the impact of noise during celebration of Deepawali as well as in the pre-Deepawali period. Out of these

53 locations, 11 locations are in Industrial zone,14 locations are in commercial zone,14 locations are in residential zone & 14 locations are in silence zone. The findings of the monitoring are summarized below and results are presented in Table-8.3.

I. Industrial Zone

The day time noise levels in the pre- and during Deepawali are found below the prescribed standard of 75 dB(A) Leq at all locations except at Ankuli Industrial Estate, Berhampur, Khapuria Industrial Estate, Cuttack, Bombay chowk, Jharsuguda, Kalinganagar Industrial Estate, Jesco Industrial Estate, Rayagada & Bareipali, Sambalpur during Deepawali.

In night time, the noise level in pre- and during Deepawali are within the prescribed standard of 70 dB(A) Leq at all locations except at Khapuria Industrial Estate Cuttack, Bombay chowk, Jharsuguda, Kalinganagar Industrial Estate, IFFCO STP, Pradeep during Deepawali and Kalinganagar Industrial Estate in pre- & during Deepawali .

II. Commercial Zone

The day time noise level were above the prescribed standard of 65 dB(A) Leq at all the locations both in pre- & during Deepawali except at Badambadi, Cuttack & Konark in pre-Deepawali.
In night time the noise level in pre and during Deepawali are above the prescribed standard of 55 dB (A) Leq at all locations.

III. Residential Zone

The day time noise levels in residential zone exceeded the standard of 55 dB (A) Leq at all locations in pre- & during Deepawali except Brahmanagar, Berhampur, Sector-4, Rourkela in pre- Deepawali.

The night time noise level in residential zone exceeded the standard of 45 dB (A) Leq at all locations in pre- & during Deepawali.

IV. Silence Zone

The day time noise level in pre- & during are found to be exceeded the prescribed standard of 50 dB (A) Leq except at Bhubaneswar & Rourkela in pre- Deepawali.
In night time noise level in pre- & during Deepawali are found to be exceeded the prescribed standard of 40 dB (A) Leq at all locations.

Table-8.3 Noise level in dB(A) Leq at different location in pre Deepawali & Deepawali day during the year 2018

Sl.No	Towns/Cities	Monitoring Locations	Pre- Deepawali		Deepawali Day	
			D	N	D	N
1	Angul	1.Amalapada(R)	66.2	64.1	72.7	69.5
		2.Bazar chhak(C)	77.1	74.4	81.1	84.3
		3.District Head Quarter Hospital(S)	60.5	65.8	64.7	63.5
		4.Hakimpada(I)	59.7	63.8	64.6	64.2
2	Balasore	5.Sahadevkhunta(R)	58.0	45.7	73.1	61.0
		6.Motiganj Bazar(C)	76.9	61.6	82.4	84.2
		7.District Head Quarter Hospital(S)	50.7	43.1	68.9	58.0
		8.Balasore Industrial Estate(I)	56.9	52.9	74.5	56.8

Sl.No	Towns/Cities	Monitoring Locations	Pre- Deepawali		Deepawali Day	
			D	N	D	N
3	Berhampur	9.Brahmanagar(R)	53.8	50.6	73.1	61.0
		10.Girija market square(C)	76.5	61.6	80.8	69.5
		11.MKCG Medical & Hospital(S)	55.2	50.8	64.2	62.0
		12.Ankuli(I)	71.8	67.6	79.3	62.6
4	Bhubaneswar	13.Nayapalli(R)	65.8	54.6	77.8	70.3
		14.Sahidnagar(C)	68.7	60.5	75.4	64.3
		15.Capital Hospital(S)	60.1	48.6	65.4	57.9
		16.Rasulgarh(I)	70.3	65.0	70.9	65.0
5	Cuttack	17.Suryavihar(R)	65.3	72.3	69.9	73.8
		18.Badambadi(C)	64.3	71.1	75.0	73.2
		19.SCB Medical College(S)	61.7	71.8	74.7	69.0
		20.Khapuria(I)	61.1	69.2	77.5	70.8
6	Jharsuguda	21.Cox colony(R)	73.3	61.0	76.4	83.6
		22.Jhanda Chowk(C)	75.2	68.7	76.9	87.3
		23.District Head Quarter Hospital(S)	71.1	61.4	75.6	91.9
		24.Bombay Chowk(I)	73.3	70.0	75.9	84.5
7	Kalinganagar	25.Sapagadia(R)	66.0	63.1	82.8	79.1
		26.Gopabandhu Chowk(C)	75.7	77.7	84.9	81.1
		27.CHC Hospital(S)	53.9	59.7	71.1	63.0
		28.Kalinga nagar industrial estate (I)	74.0	75.9	81.9	83.4
8	Keonjhar	29.Baniapat Chowk(R)	76.2	72.9	67.7	75.3
		30.Punjabi Chowk(C)	81.0	72.2	82.6	85.6
		31.Govt.Hospital(S)	67.7	69.9	78.9	74.5
9	Konark	32.Madhipur(R)	59.4	55.9	70.4	60.4
		33.NAC Market(C)	63.3	58.1	82.9	65.7
		34.Public Health Centre(S)	55.0	47.2	66.2	58.9
10	Paradeep	35.PPT Colony(R)	62.6	62.6	77.5	70.0
		36.Badapadia Market(C)	68.9	61.6	75.8	72.6
		37.Bijumemorial Hospital(S)	60.9	60.3	76.4	69.1
		38.IFFCO Ltd(I)	68.6	60.0	74.0	70.5
11	Puri	39.Kumutisahi, Old Sadar lane(R)	67.4	57.1	80.1	67.3
		40.Sri Mandir(C)	78.0	71.2	87.0	67.0
		41.District Head Quarter Hospital(S)	65.3	57.2	74.2	63.5
12	Rayagada	42.Indiranagar(R)	65.5	60.2	83.7	71.5
		43.Main market(C)	77.4	58.7	79.2	62.9
		44.District Head Quarter Hospital(S)	72.0	70.6	77.6	66.6
		45.Jesco(I)	67.9	60.3	75.1	69.0

Sl.No	Towns/Cities	Monitoring Locations	Pre- Deepawali		Deepawali Day	
			D	N	D	N
13	Rourkela	46.Sector-4(R)	45.3	45.4	75.9	61.5
		47.Bisra Chowk(C)	74.6	71.2	85.3	73.3
		48.IGH steel Township(S)	43.8	40.8	52.2	45.1
		49.RSPL Sail(I)	60.8	53.0	65.3	53.5
14	Sambalpur	50.Ainthapali(R)	67.2	62.4	77.2	71.2
		51.Golebazar(C)	73.4	63.7	91.0	87.7
		52.District Head Quarter Hospital(S)	59.5	52.4	69.0	67.0
		53.Bareipali(I)	62.3	61.2	75.9	66.6

Ambient Noise Standard (In Leq dB(A))		
Category of area zone	Day Time	Night Time
Industrial area(I)	75	70
Commercial area(C)	65	55
Residential area(R)	55	45
Silence area(S)	50	40

N.B:- D-Day Time monitoring period (6PM to 10PM), N-Night Time monitoring period (10PM to12 AM)

IMPACT OF DEEPAWALI CELEBRATION ON AMBIENT AIR QUALITY

State Pollution Control Board, Odisha has also monitored the Ambient Air Quality on pre & during Deepawali at 36 locations in 16 towns/cities i.e. at Angul, Balasore, Berhampur, Bhubaneswar, Bonaigarh, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Rayagada, Rajgangpur, Rourkela, Sambalpur & Talcher with respect to parameters like SO_2, NO_2, PM_{10} (at 36 locations) & $PM_{2.5}$ (at 25 locations)to assess the impact of brusting of fire crackers on the surrounding ambient air quality.

The SO_2 & NO_2 values on pre- & during Deepawali were below the prescribed limit i.e. 80 µg/m^3 (on 24-hourly average basis) at all 36 locations. The respirable dust particle matter (PM_{10}) values were below prescribed limit i.e. 100 µg/m^3 on 24-hourly average basis at 02 locations on the day of Deepawali and at 32 locations on pre-Deepawali out of 36 locations whereas, $PM_{2.5}$ values were below prescribed limit of 60 µg/m^3 on 24-hourly average basis at 03 locations on the day of Deepawali and at 22 locations on pre-Deepawali out of 25 monitoring locations (11 locations are not monitored during Deepawali & 12 locations are not monitored on pre-Deepawali). The concentration of gaseous pollutants, respirable particulate matter (PM_{10}) & fine particulate matter ($PM_{2.5}$) shows higher value on the day of Deepawali than the corresponding pre-Deepawali value at most of the locations.

The monitoring results are given in following Table-8.4.

Table-8.4 Ambient Air Quality status of major cities/towns in the pre & during Deepawali-2018

Sl No	Towns/cities	Monitoring Locations	Parameter Monitored							
			SO_2		NO_2		PM_{10}		$PM_{2.5}$	
			Values are expressed in microgram per cubic meter							
			Pre	During	Pre	During	Pre	During	Pre	During
1	Angul	1. Industrial Estate	8.8	19.8	24.9	34.5	65	123	28	74
		2. Nalco Township	9.5	12.7	27.5	30.1	69	105	35	69
2	Balasore	3.Sahadevkhunta	BDL	BDL	11.1	14.3	85	144	30	95
		4.DIC Office Angaragadia	BDL	BDL	10.9	13.8	83	141	34	89
		5.Rasalpur Industrial Estate	7.8	8.6	12.3	12.5	94	117	55	78

Sl No	Towns/cities	Monitoring Locations	Parameter Monitored							
			SO_2		NO_2		PM_{10}		$PM_{2.5}$	
			Values are expressed in microgram per cubic meter							
			Pre	During	Pre	During	Pre	During	Pre	During
3	Berhampur	6.Brahmanagar	BDL	15.6	14.5	32.3	57	288	NM	NM
		7.Girija market square	BDL	28.2	30.5	52.2	86	310	NM	NM
		8.MKCG Medical College& Hospital	BDL	10.2	12.3	25.6	27	195	NM	NM
		9.Industrial Estate, Ankuli	BDL	24.3	16.3	48.6	34	99	24	63
4	Bhubaneswar	10.Office Building	BDL	4.6	19.5	20.0	51	258	NM	NM
		11.IRC Nayapalli	BDL	7.6	23.0	44.0	98	172	42	102
		12.Capital Police Station	NM	13.6	NM	20.9	88	159	NM	38
		13.Patrapada	BDL	BDL	14.4	15.8	80	131	NM	NM
		14.Chandrasekharpur	BDL	14.7	24.7	38.4	96	205	33	84
		15.Palasuni water works	BDL	5.2	22.3	25.6	92	105	33	41
5	Bonaigarh	16.Govt. Hospital Bonai	8.9	12.9	12.4	17.4	82	157	29	72
6	Cuttack	17.Roof of PHD Office near Barabati Stadium	BDL	6.3	30.6	34.8	82	151	35	95
		18.RO Office building Suryanagar	BDL	8.8	26.9	42.0	101	280	35	119
7	Jharsuguda	19. RO Building, Cox Colony, Babubagicha	8.9	28.9	19.2	39.0	94	229	37	152
8	Kalinganagar	20.Roof of BRPL Guest House	BDL	BDL	10.7	12.7	91	167	NM	NM
		21.Regional Office Building,	BDL	BDL	14.4	24.0	39	201	NM	NM
9	Keonjhar	22.Regional Office Building	BDL	BDL	11.0	18.1	86	128	NM	NM
10	Konark	23. Konark Police Station	BDL	BDL	11.0	15.9	84	86	NM	NM
11	Paradeep	24. Paradeep Port Trust Staff Quarter	14.2	24.0	10.3	20.6	43	152	16	97
		25. Guest House, Paradeep Phosphate Ltd	14.3	23.1	10.0	17.2	43	162	NM	NM
		26. On the Roof of STP Building, IFFFCO	12.6	25.2	10.4	19.2	43	130	NM	NM
12	Rayagada	27.On the roof of Regional office Building	4.2	18.7	17.9	31.2	61	161	41	118
		28.LPS High School	4.2	14.3	20.1	26.9	65	149	42	96
13	Rajgangpur	29.DISIR Rajgangpur	15.6	20.3	21.0	35.9	173	183	56	66
14	Rourkela	30.Roof of Regional office Building	9.9	25.7	15.3	43.5	78	188	71	110
		31.IDL Police Outpost	7.0	14.8	10.9	20.0	79	101	59	101
		32.IDC Kalunga	10.2	20.2	14.3	25.7	205	265	74	93
		33. Kuarmunda Hospital, Kuarmunda	6.8	15.1	9.8	20.8	122	154	50	59
15	Sambalpur	34.Modipara	5.0	39.1	21.9	42.8	70	287	39	220
16	Talcher	35.Talcher Thermal	9.8	15.3	28.0	34.0	84	147	36	89
		36. MCL area, Talcher	10.6	13.4	27.9	33.9	93	159	41	94
Standard on 24hrly avg. Basis			**80**		**80**		**100**		**60**	

N.B- BDL-Below Detection Limit,BDL value for SO_2 ≤4 µg/m^3, NM-Not Monitored

8.5.2 Impact of Immersion of Idols in Water Bodies

Durga Puja is celebrated in massive scale in most of the cities of the State of Odisha. Generally the idols are immersed on a single day at the designated sites of the rivers flowing along the cities. To minimize the impact of idol immersion on the water quality, the State Pollution Control Board, Odisha has taken following steps as recommended in the Guideline for idol immersion.

- Informed all the District Collectors and authorities of urban local bodies of the State prior to Ganesh Puja and Durga Puja to implement the Guidelines of Immersion in their areas of jurisdiction.
- Created public awareness through Public Notice on safe Idol immersion practices in Local Newspapers and in Board's website and through public address system.
- Several meetings with the local bodies/ authorities, Puja Committee Organizers to create awareness on ill impacts of Idol immersion in water bodies.
- Coordinated with the local bodies/ authorities for construction of temporary immersion ponds near rivers as prescribed in the Guideline.
- Generally idols are immersed in flowing waters which makes the rivers as the ideal places for idol immersion. In such cases, as per the recommendation in the Guideline, either temporary ponds having earthen bunds along the river bank for use as idol immersion spots had been constructed or a part of the river bed had been cordoned to demarcate it as idol immersion site. The bottom of the pond in either cases had been lined with removable synthetic liner well in advance of the idol immersion. The said liner along with remains of the idols were removed within 48 hours of idol immersion by the local bodies and disposed in the municipal dumpsites. The water of the temporary ponds was then treated with lime and allowed to settle prior to ultimate discharge into rivers.

Appel to public to observe pollution free Ganesh puja, Durga puja, Laxmi puja and Kali puja through public notice on Local Newspapers.

ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ, ଓଡ଼ିଶା

Samaj 15.8.18

ପ୍ରଦୂଷଣମୁକ୍ତ ଗଣେଶ ପୂଜା, ଦୁର୍ଗାପୂଜା, ଲକ୍ଷ୍ମୀପୂଜା ତଥା କାଳୀପୂଜା ନିମନ୍ତେ ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡର ନିବେଦନ

ପୂଜା କମିଟି ଅର୍ଗନାଇଜର ମାନଙ୍କେ ଉଦ୍ଦିଷ୍ଟ ନିବେଦନ

ବିଭିନ୍ନ ପୂଜାର ତଥା ପୋଖରୀର ବର୍ଜ୍ୟାଞ୍ଚଳ ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ ନିବେଦନ

ଆସନ୍ତୁ ନିମ୍ନଲିଖିତ ପ୍ରଦୂଷଣମୁକ୍ତ ପୂଜା ପାଳନ ନିମନ୍ତେ ସଙ୍କଳ୍ପ କରିବା।

ଓଡ଼ିଶା ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ

Samaj Dt. 15.08.2018

STATE POLLUTION CONTROL BOARD, ODISHA

(DEPARTMENT OF FOREST & ENVIRONMENT, GOVT. OF ODISHA)

Paryavesh Bhawan, A/118, Nilakantha Nagar, Bhubaneswar-751012

APPEAL TO OBSERVE POLLUTION FREE GANESH PUJA, DURGA PUJA, LAXMI PUJA AND KALI PUJA

Puja Committees / Organisers:

- Use natural clay for making of idols instead of baked clay, plaster of paris etc.
- Use water soluble and nontoxic natural dyes for painting of idols instead of toxic and non-biodegradable chemical dyes.
- Remove worship materials like flowers, decorating materials before immersion of idols and to be disposed of in municipal dump site and make sure that they are not burnt near the immersion site.
- Immerse Idols only at the identified immersion sites constructed by the District authorities or Local bodies.
- Do not use plastic materials for decoration purpose and Prasad sevan or distribution.

District Authorities / Local Bodies

- Identify adequate number of designated immersion sites and inform the Puja Committee authorities well in advance.
- In case of immersion of idols in rivers and lakes, arrangements may be made for construction of temporary confined ponds with earthen bunds and removable synthetic liner for the purpose of immersion of idols. Identify the immersion sites at the points where the flow in stream is naturally available.
- Within 48 hours of the immersion, the left over materials from the immersion site shall be removed for disposal at designated municipal dump site and the supernatant water may be allowed to flow into the river after adding lime to clear the water.

LET US TAKE A PLEDGE TO OBSERVE A POLLUTION FREE PUJA

Note: The detail guideline in this regard can be downloaded from CPCB Website (www.cpcb.nic.in) or SPCB Website (www.ospcboard.org)

MEMBER SECRETARY

Times India Dt. 09.08.2018

- In some urban local bodies, though temporary immersion ponds were not constructed specifically for idol immersion purposes, the left-overs of idol immersion were removed by the local peoples within 48 hours of idol immersion and disposed at the municipal dumpsites.
- Conducted water quality assessment of Kuakhai River and Daya river along Bhubanewar city, Kathajodi river along Cuttack city and Musa river along Puri city.
- Water quality status was assessed with respect to the physico-chemical parameters as recommended in the Guideline, such as, pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Conductivity (EC), Turbidity, Total Dissolved Solids (TDS), Total Solids (TS), and metals (cadmium, chromium, iron, lead, zinc and copper).
- Water quality status is evaluated by comparing with the tolerance limits for Class A (Drinking water source without conventional treatment but after disinfection) and Class C (Drinking water source with conventional treatment followed by disinfection) Inland surface water quality. The variation in concentration of different parameters at the immersion sites are compared with the values at the upstream and downstream of immersion sites to assess the impact of idol immersion.

Obervation from the water quality data.

- Turbidity and Suspended solids in Kathajodi river along Cuttack city and in Daya river along Bhubaneswar during-immersion period was observed to be higher in comparison to the pre- and post-immersion period. This may be attributed to the increase in suspended materials on the water body during immersion of idols. Whereas, no significant change was observed in case of turbidity and Suspended solid values in Kuakhai river along Bhubaneswar and Musa river along Puri city.
- Dumping of puja materials and left-overs into the water body disrupts the oxygen level of water body and therefore increase in BOD and COD values at the immersion site on the day of idol immersion were also observed. By the time of post-immersion monitoring, the river water rejuvenates itself due to continuous flow of water, which is indicated by lowering of BOD values and other parameters in Kuakhai and Daya rivers along Bhubaneswar city. However, BOD values of the river water at all these monitoring locations remained well within the tolerance limit of 3.0 mg/l during all the three phases of monitoring.
- BOD values in Musa river in Pre-immersion period was more than the tolerance limit of 3.0 mg/l. Immersion of idols in the Musa river has increased the BOD level significantly.
- During immersion period increase in the conductivity and total dissolved solid at the immersion site in comparison to the upstream and downstream stations may be ascribed to the leaching of dissolved materials form the puja materials and idols immersed in the water body.
- Variation in concentrations of heavy metals such as cadmium, lead, copper and hexavalent chromium during the period of study was not significant.
- Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper in both during-immersion and post-immersion period remain much below the tolerance limit for most beneficial uses of water. This may be correlated to the very slow leaching process of heavy metals from the synthetic paints and other materials used in the idols in natural conditions of water bodies.

- Further, because of the preventive measures taken by the district administration not to allow the water of idol immersion ponds to flow into the river, water quality of downstream stations during-immersion and Post-immersion periods mostly remained well within the tolerance limits of the designated use.

  From the study, it may be concluded that all the parameters specified for the study remained within the tolerance limit for designated class of the river i.e. Class-C (Drinking water source with conventional treatment followed by disinfection) even after immersion of idols excepting few cases. Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper remain much below the tolerance limits and no significant impact is exerted on the heavy metal concentration of the water bodies due to immersion of idols. Though some of the physical and chemical parameters like Turbidity, electrical conductivity, TDS and BOD shows higher values during-immersion period in comparison to the pre-and post-immersion period, but still remained much below the tolerance limit. Further, immersion of idols in the temporary immersion ponds has minimized the probability of contamination of the main course of river water.

8.5.3 Impact of mass bathing during Kartika Purnima on Water quality of Mahanadi and Kathajodi river (Cuttack Stretch)

To assess the impact of mass bathing during Kartika Purnima on water quality of river Mahanadi and Kathajodi along the Cuttack city, the Board had conducted a water quality monitoring study at the major bathing ghats on Pre- (16.11.2018), During- (23.11.2018) and Post- (30.11.2018) Kartika Purnima. Water quality was assessed with respect to the physico-chemical parameters like pH, Dissolved oxygen (DO), Biochemical oxygen demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS) and bacteriological parameters e.g. Total Coliform (TC) and Fecal Coliform (FC).

Comparison of the water quality data with the bathing water quality standard prescribed under IS: 2296 (1982) and organized bathing water quality standard laid down by MoEF & CC (* MoEF Notification G.S.R. No. 742(E) Dt. 25th September, 2000), it has been revealed that, pH remained within the permissible range 6.5-8.5 at all the monitored locations. Dissolved oxygen remained well above the permissible limit of 5.0 mg/l on all occasions. However, an increase in BOD level at the bathing ghats are observed during the Kartika Purnima period which has been lowered to the prescribed limit of 3.0 mg/l during the post- Kartika Purnima period. Further, significant impact on the bacteriological quality with respect to total coliform and fecal coliform are observed at the bathing ghats of Mahanadi river and Kathajodi rivers on the day of Kartika Purnima due to mass bathing and other human activities. Water quality data with respect to BOD, TC and FC in Pre-, During- and post-Kartika Purnima period is given in Table-8.5.

Table- 8.5 Water quality with respect to BOD , TC and FC at the bathing ghats of Mahanadi river and Kathajodi rivers on Pre-, During- and Post-Kartika Purnima -2018

Sl. No.	Location	BOD (mg/l)			TC (MPN/100ML)			FC (MPN/100ML)		
		Pre (16.11.18)	During (23.11.18)	Post (30.11.18)	Pre (16.11.18)	During (23.11.18)	Post (30.11.18)	Pre (16.11.18)	During (23.11.18)	Post (30.11.18)
Mahanadi River										
1	Mundali	1.1	1.2	1.1	1100	1300	1700	130	130	110
2.	Naraj	1.1	1.1	1.2	790	1100	460	220	330	130
3.	Chahata Ghat	0.9	1.1	0.9	5400	>160000	35000	2400	>160000	17000

Sl. No.	Location	BOD (mg/l)			TC (MPN/100ML)			FC (MPN/100ML)		
		Pre (16.11.18)	During (23.11.18)	Post (30.11.18)	Pre (16.11.18)	During (23.11.18)	Post (30.11.18)	Pre (16.11.18)	During (23.11.18)	Post (30.11.18)
4.	Gadagadia Ghat	1.1	3.1	1.1	>160000	>160000	>160000	54000	>160000	35000
5.	Zobra	0.9	3.9	0.9	>160000	>160000	>160000	54000	160000	35000
6.	Kanehipur	0.9	3.9	1.1	2400	160000	7900	1300	24000	4900
Kathajodi River										
7.	Puri Ghat	1.2	3.2	0.9	7000	24000	9200	1700	7900	5400
8.	Khan Nagar	1.1	4.2	1.2	5400	24000	2100	1700	2300	700
9	Urali	1.4	3.9	1.1	>160000	>160000	54000	>160000	>160000	35000
Tolerance limit for Class B (IS-2296-1982) / E (P) Rule, 1986 *		**3.0**			**500**			**500 (Desirable)* 2500 (Permissible)***		

*** MoEF Notification G.S.R. No. 742(E) Dt. 25th September, 2000**

8.6 OTHER ONGOING PROJECTS

8.6.1 Survey and Monitoring of Ground and Surface Water Quality with respect to Fluoride Content around Phosphatic Fertilizer Units, Paradeep

The Board has conducted a survey on ground water and surface water quality in and around phosphatic fertilizer plants of Paradeep e.g. M/s Indian Farmers Fertiliser Corporation (IFFCO) and M/s Paradeep Phosphates Ltd. (PPL). During 2018, surface water samples were collected from Atharabanki creek from different locations around these two fertilizer plants. Ground water samples were collected from the test wells of both the plants and from three locations outside the plant. Water quality monitoring was done on quarterly basis during the months of February, May, August and November.

The fluoride concentration in Atharabanki creek at the upstream of the fertilizer plants varies within 0.973 - 3.38 mg/l. As the flow of Atharabanki creek depends upon the tidal condition of the sea, it is not unidirectional, and therefore, wide fluctuation in fluoride content is observed in Atharabanki creek water. The fluoride concentration in Atharabanki creek varies within 0.973-12.7 mg/l. The fluoride concentration in creek water at Bhimbhoi colony varies within 2.59 – 7.12 mg/l, near entrance gate to Paradeep Port Township varies within 2.08 – 10.5 mg/l, near conveyor belt of IFFCO varies within 2.40 - 12.7 mg/l. Whereas, the fluoride concentration in the creek water near fishing jetty varies within 0.677 - 1.67 mg/l. Near fishing jettey the water quality is greatly influenced by sea water.

Fluoride concentration in the surface run-off drain near Gypsum pond of M/s PPL near Shyamakoti bridge varied within 1.78-6.99mg/l, whereas, Fluoride concentration in the surface run-off drain near Loknath colony varied within 0.423-0.838 mg/l.

The test wells around M/s IFFCO exhibit fluoride concentration within 0.124-0.333 mg/l, whereas, those around M/s PPL exhibit fluoride concentration 0.71-6.67 mg/l.

Fluoride content in ground water samples collected from outside of the plant area i.e. at Badapadia, varies within 0.282-1.45 mg/l, whereas in Musadiha, the fluoride concentration varies within 0.266 – 0.435 mg/l and inside the Shiv temple, it varies within 0.485 – 0.981 mg/l. Fluoride content in ground water monitored at public locations remained within the acceptable limit of 1.5 mg/l.

8.6.2 Studies related to Pollution Control and Planning

To study the cause of high ambient temperature and design remedial measures the Board has instituted Heat Island study for Angul-Talcher area through IIT, Delhi. Similar study for Ib Valley-Jharsuguda area has been instituted by DFID in association with SPCB. The study is being conducted by TERI, Delhi. Both these studies have been completed.

8.7 LIBRARY AND INFORMATION SERVICE

Board's Library acts as a document repository and referral centre for dissemination of information in the field of environmental science and engineering and its associated areas. The Library is used by research scholars of different Universities and technical Colleges, institutions in Odisha, various NGOs and Social activists .The library has a collection of Books, Reports, Audio Visual materials, Maps, Photographs, Topo sheets, River Basin Atlas and soft copies of different aspects of environmental science and engineering. During 2018 –19,the library has received 52 Books on complimentary,45 Reports,19 Journals,11 Newspaper and 02 Magazines. 1634 News clippings on environmental issues from various sources of information have been collected for reference of the users. 03 no of outside scholars have been enrolled as library members on payment basis during the period. Besides News clipping, 865 pages of reprographic service to different outside members have been provided on payment basis. A sum of Rs. 1, 32,368/- (Rupees One Lakh thirty two thousand three hundred sixty eight) only has been spent towards Books & Journal during the year 2018-19.

8.8 TRAINING OF BOARD OFFICIALS

The Board has deputed its officials on various training programmes, seminars and workshops for the up-gradation of their knowledge and exposure to recent technological advancements in the field of pollution control and environment protection issues.

The list of officials of the Board along with name of training programmes / workshops / seminars(national / international) in various institutions attended during 2018-19 is given in Table - 8.6.

Table - 8.6 Training Programme attended by Officials of the Board

A. Training / Workshop / Seminar attended by Officials of the Board

Sl. No	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
1	Dr. D. K. Behera Sr. Env. Scientist(L-I) **(As Resource Person)**	16th April, 2018	National Training Programme on Audit of Environmental Issues in Mining and Extractive Industries	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan
2	B. K. Nayak, Sr. Env. Scientist	21st April, 2018	State Level Workshop on National Brick Mission: Roadmap for Brick Kiln	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Bengal National Chamber of Commerce & Industry (BNCCI), 23, R. N. Mukherjee Road, Kolkata
3	Er. Maheswar Behera, AEE, Regional Office, Berhampur	24th-26th April, 2018	Training Programme on "Industrial Pollution Management – Compliance & Enforcement Practices in Sweden"	West Bengal Pollution Control Board, Kolkata	West Bengal Pollution Control Board, Kolkata

Sl. No	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
4	Er. Madan Mohan Sahoo, AEE, Regional Office, Paradeep	24th-26th April, 2018	Training Programme on "Industrial Pollution Management – Compliance & Enforcement Practices in Sweden"	West Bengal Pollution Control Board, Kolkata	West Bengal Pollution Control Board, Kolkata
5	Dr. D. K. Behera Sr. Env. Scientist(L-I) **(As Resource Person)**	28th April, 2018	National Conference on "Importance of EHS (Environment, Health & Safety) in Emerging Economics"	MDC on SHE, Patia, Bhubaneswar	MDC on SHE, Patia, Bhubaneswar
6	Dr. D. K. Behera Sr. Env. Scientist(L-I) **(As Resource Person)**	2nd May, 2018	Environmental Laws	Odisha Judicial Academy, Cuttack	Odisha Judicial Academy, Cuttack
7	Dr. D. K. Behera Sr. Env. Scientist(L-I) **(As Resource Person)**	9th May, 2018	National Training Programme on Audit of Waste Management	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan
8	Dr. A. K. Swar, Sr. Env. Engineer (L-I)	9th – 11th May, 2018	Workshop on "Best Practices in Environment Management in Fertilizer Industry"	The Fertilizer Association of India, FAI House, 10, Shaheed Jit Singh Marg, New Delhi	Hotel Fortune Park Sishmo, Bhubaneswar
9	Kainta Tudu, Env. Scientist	20th May, 2018	Brain Storming Session on "Surface and Ground Water Resources – Status, Policy and Strategies	Society of Geoscientists and Allied Technologists (SGAT, D-20, BJB Nagar, Bhubaneswar	SGAT, Bhubaneswar
10	Er. Rajat Kumar Sethi, AEE, RO, Bhubaneswar	20th May, 2018	Brain Storming Session on "Surface and Ground Water Resources – Status, Policy and Strategies	Society of Geoscientists and Allied Technologists (SGAT, D-20, BJB Nagar, Bhubaneswar	SGAT, Bhubaneswar
11	Dr. N. R. Sahoo, Sr. Env. Engineer (L-I) **(As Resource Person)**	31st May, 2018	Sustainable Mining Summit on "SDF & Outlook for Sustainable Mining and Technological Development"	Federation of Indian Mineral Industries (FIMI), FIMI House, Okhla Industrial Area, Phase-I, New Delhi-110020	Hotel Mayfair Lagoon, Bhubaneswar
12	Dr. M. Mahaling Regional Officer, SPC Board, paradeep	2nd August, 2018	23rd National Oil Spill Disaster Contingency Plan (NOS-DCP) & Preparedness Meeting	Indian Coast Guard, New Delhi	Narayani Heights, Narayani Hotels & Resorts Ltd., Gandhinagar Gujurat
13	P. C. Behera, Dy. Env. Scientist, Regional Officer, Keonjhar	8th – 10th August, 2018	Training Programme on "Noise Monitoring and Control Techniques"	National Institute of Occupational Health, Poojanahalli Road, Kannamangala Post, Devanahalli, Bangalore (CPCB Sponsored)	NIOH, Bangalore

Sl. No	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
14	Murali Gopal Chetty, Section Officer	10th August, 2018	Workshop on "Implementation of National Pension System (NPS)" for Employees of State Autonomous Bodies (SABs) and State Public Sector Undertakings	Pension Fund Regulatory and Development Authority (PFRDA), B-14/A, Chhatrapati Shivaji Bhawan, Qutab Institutional Area, Katwaria Sarai, New Delhi	Directorate of Treasuries & Inspection, Bhubaneswar
15	Dr. S. K. Mohanty, Env. Scientist	29th August, 2018	Workshop on "Real-time Nationwide Low-Cost Sensor Network for Air Quality Monitoring"	MoEF&CC, New Delhi	Ganga Auditorium, Indira Paryavaran Bhawan, Jor Bagh Road, MoEF&CC, New Delhi
16	Bibhuti Bhusan Mohanty, ASO, Regional Office, Kalinganagar	29th – 31st August, 2018	Training Programme on "Advance Instrumental Analytical Techniques"	CSIR-National Environmental Engineering Research Institute (NEERI), Nagpur & sponsored by CPCB, New Delhi	CSIR-National Environmental Engineering Research Institute (NEERI), Nagpur
17	Dr. N. R. Sahoo Chief Env. Engineer	4th to 7th September, 2018	Training Programme on "Compliance, Monitoring & Enforcement Practices in India and Sweden"	Madhya Pradesh Pollution Control Board, Paryawaran Parisar, E-5, Arera Colony, Bhopal-462016, Madhya Pradesh	Bhopal, Madhya Pradesh
18	Dr. D. K. Behera Sr. Env. Scientist(L-I) **(As Resource Person)**	19th – 21st September, 2018	National Training Programme on "Audit of Implementation of Air and Water Pollution Regulations"	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan	Internactional Centre for Environmental Audit and Sustainable Development (iCED), Jaipur, Rajasthan
19	Er. Deepesh Biswal, AEE	25th -27th September, 2018	Training on Accidental Spill-Emergency Response & Environmental Impact Assessment-Future Perspective	NEERI, Nagpur & sponsored by CPCB, New Delhi	NEERI, Nagpur
20	Ms. T Mohanty, AEE, RO, Rourkela	25th -27th September, 2018	Training on Accidental Spill-Emergency Response & Environmental Impact Assessment-Future Perspective	NEERI, Nagpur & sponsored by CPCB, New Delhi	NEERI, Nagpur
21	Dr. S. S. Pati, Asst. Env. Scientist, Central Laboratory	4th – 6th October, 2018	Training Programme on "Taxonomical Identification of Macro Invertible in Biological Testing"	NEERI, Nagpur & sponsored by CPCB, New Delhi	NEERI, Nagpur
22	Dr. Sohan Giri Env. Scientist Regional Officer, Cuttack	12th – 19th October, 2018	Training programme on "Best Practices in Environmental Governance"	CSE, New Delhi	Stockholm, Sweden
23	Er. R. Priyadarshini, Dy. Env. Engineer, Regional office, SPC Board, Cuttack	14th – 16th October, 2018	Training programme on"Design, Operation, Maintenance and Performance of STP, CETP, CBMWTFs"	ESCI Campus, Hyderabad & sponsored by CPCB, New Delhi	ESCI Campus, Hyderabad

Sl. No	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
24	Er. Sitikantha Sahu Sr. Env. Engineer (L-II)	13th November, 2018	Swachh Bharat Mission Solid Waste Management Exposure Workshop, 2018	Core CrbonX Solutions Pvt. Ltd., Hyderabad	Hotel Pride Ananya Resort, Puri
25	Sangeeta Mishra, Asst. Environmental Scientist	20th - 22nd November 2018	Training Programme on " Biological Monitoring, Analysis & testing (Microbiological, Bioassay & Biomonitoring), SOPs, Data interpretation & Quality Assurance"	Panjab University, Chandigarh & sponsored by CPCB, New Delhi	Panjab University, Chandigarh
26	Madan Mohan Sahoo, AEE, RO, Kalinganagar	26th – 28th November, 2018	Training programme 'Global Warming, Climate Change and Disaster Management – Future Perspective'	EPTRI, Hyderabad & sponsored by CPCB, New Delhi	EPTRI, Hyderabad
27	Dr. D. K. Behera, Sr. Env. Scientist (L-I)	27th November, 2018	Swachh Bharat Mission Solid Waste Management Exposure Workshop, 2018	Core CrbonX Solutions Pvt. Ltd., Hyderabad	Hotel Pride Ananya Resort, Puri
28	Pramod Kumar Behera, Env. Engineer, RO, Kalinganagar	12th – 14th December, 2018	Training Programme on "Planning, Designing, Monitoring and Inspection of Waste Water Treatment Plants and APC Measures"	National Productivity Council, Chennai & sponsored by CPCB, New Delhi	National Productivity Council, Chennai
29	Dr. D. K. Behera, Sr. Env. Scientist (L-I)	19th – 20th December, 2018	Eastern Region Workshop on Waste Management Rules, 2016	MoEF&CC & Confederation of Indian Industry (CII)	Ranchi
30	Dr. R. K. Mishra, Env. Scientist, Regional Office, Bhubaneswar	23rd December, 2018	National Seminar on Plants for Sustainable Development and Clean Environment	Centurion University of Technology and Management, Jatni, Khordha	Centurion University of Technology and Management, Jatni, Khordha
31	Dr. D. K. Behera, Sr. Env. Scientist (L-I) **(Resource Person)**	8th January, 2019	Lecture on "Environmental Laws" to the Probationary Civil Judges	Odisha Judicial Academy, Cuttack	Odisha Judicial Academy, Cuttack
32	Dr. Anup Kumar Mallick, Env. Scientist, Regional Officer, Angul	21st – 23rd January, 2019	Training programme on "Monitoring of Notified Air Pollutants as per Revised NAAQS 2009"	The Energy & Resources Institute (TERI), Delhi & sponsored by CPCB, New Delhi	The Energy & Resources Institute (TERI), Delhi
33	Dr. P. K. Mohapatra, Env. Scientist, Regional Officer, Balasore	4th - 6th February, 2019	Training Programme on "Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting – Hands-on Training and Case Study"	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi & sponsored by CPCB, New Delhi	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi

Sl. No	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
34	Shri Sarat Kumar Mohanty, Sr. Scientific Asst., Central Laboratory	4th - 6th February, 2019	Training Programme on "Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting – Hands-on Training and Case Study"	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi & sponsored by CPCB, New Delhi	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi
35	Shyamghan Pradhan, Assistant Env. Scientist, Central Laboratory	11th – 13th February, 2019	Training Programme on Water Quality Monitoring of Surface, Ground, Waste Water / Effluent, Data Processing and Quality Assurance	National Institute of Hydrology (NIH), Roorkee - 247 667 (Uttarakhand) & sponsored by CPCB, New Delhi	National Institute of Hydrology (NIH), Roorkee - 247 667 (Uttarakhand)
36	Dr. C. P. Das Env. Scientist	26th February to 1st March, 2019	Training programme on "Environmental Norms for Coal Power Plants – Implementation, Monitoring and Compliance"	Centre for Science & Environment (CSE), New Deldi	Anil Agarwal Environment Training Institute (AAETI), Nimli, Alwar, Rajasthan
37	Dr. A. K. Swar, Chief Environmental Engineer	15th February, 2019	One-day Conference on "Sustainable and Environment-friendly Industrial Production"	Sustainable and Environmental-friendly Industrial Production, Auftragsverantwortlicher (In-charge of the Commission), B-5/1, First Floor, Safdarjung Enclave, New Delhi-110029	New Delhi
38	Dr. N. R. Sahoo, Chief Env. Engineer	29th January, 2019	Workshop on "Policy Dialouge on Environment and Climate Change"	Integrated Research and Action for Development (IRADe)	Hotel Swosti Grand, Bhubaneswar
39	Dr. S. K. Mohanty, ES, Central Laboratory	12th to 15th March, 2019	Training programme on "Urban Air Quality Management Strategies"	Centre for Science & Environment (CSE), New Deldi	Anil Agarwal Environment Training Institute (AAETI), Nimli, Alwar, Rajasthan
40	Er. S. N. Mohanty, AEE, RO, Angul	12th to 15th March, 2019	Training programme on "Urban Air Quality Management Strategies"	Centre for Science & Environment (CSE), New Deldi	Anil Agarwal Environment Training Institute (AAETI), Nimli, Alwar, Rajasthan

B. Training / Workshop / Seminar Organised / Sponsored by Board

Sl. No.	Training Programme	Duration	Venue	Organised / Sponsored by
1	Conference on "Climate Change Initiatives"	31st May, 2018	Hotel Hindustan International, Bhubaneswar	Indian Chamber of Commerce, ICC Towers, 4, India Exchange Place, Kolkata & State Pollution Control Board, Odisha
2	Beat Plastic Pollution on the eve of "World Environment Day"	2nd - 5th June, 2018	Vigyan Bhawan, New Delhi	MoEF&CC & SPCB, Odisha

Sl. No.	Training Programme	Duration	Venue	Organised / Sponsored by
3	Observation of "World Environment Day"	5th June, 2018	Unit-II Market Building Complex, Bhubaneswar	Rotary Club of Bhubaneswar, Rotary Bhawan, Plot No.A-5/2 & 5/3, Unit-IX, Bhubaneswar in collaboration with SPCB, Odisha
4	Workshop on "Interlocking Bricks and its Utilization for housings – A Case Study of Nepal"	8th August, 2018	Raptani Bhawan, Nayapalli, Bhubaneswar	Terrablock Machinery, 239, Kharvela Nagar, Bhubaneswar
5	National Conclave on Climate Change and Industry	27th – 28th October, 2018	Hotel The New Marrion, Bhubaneswar	IMS, OCHC Complex in collaboration with SPCB, Odisha
6	Conference on "Environmental Regulatory Compliance-Industries and Mines Prospective"	30th November, 2018	Hotel Swosti Premium, Bhubaneswar	Indian Chamber of Commerce, Bhubaneswar & State Pollution Control Board, Odisha
7	One Day Workshop on Continuous Emission Monitoring System (CEMS) and Star Rating Programme	13th November, 2018	Hotel Swosti Premium, Bhubaneswar	Energy Policy Institute University of Chicago (EPIC India), Bhubaneswar & State Pollution Control Board, Odisha
8	Stakeholders Workshop on Air Quality Action Plan for Non-attainment Cities of Odisha	22nd December, 2018	Hotel Crown, Bhubaneswar	F & E Dept., Govt. of Odisha, State Pollution Control Board, Odisha, Bhubaneswar & Centre Science & Environment, Delhi

8.9 OTHER ACTIVITIES

8.9.1. Training on Pollution Control and Environmental Protection

- Interaction meets on "Environmental Management in Kalinganagar Industrial area was organized by State Pollution Control Board, Kalinganagar on 08.08.2018 in the office of the Additional District Magistrate, Kalinganagar, Jajpur.
- Workshop on E-Waste Management Rules -2016 organised by Regional Office, Paradeep on 14th Dec'2018 at Paradeep Port Trust Officer's Club, Paradeep involving the stake holders & Corporate houses in Paradeep area.
- A meeting has been conducted in the conference hall of Regional Office, SPCB, Paradeep and Officer Club of Paradeep Port Trust Involving the officials and representative from various stake holders i.e. Paradeep Municipality, Paradeep Port Trust, all Banika Sangha of Paradeep and NGOs to aware the people to ban plastic products like plastic tea cups & polythene Carry bag having thickness less than 50 microns.

8.9.2. Human Resource Development

- The Board has conducted various programmes by the Centre for Excellence for imparting training to various stakeholders on pollution control and environment protection and also deputed its officials on exposure training and to acquire knowledge in the above field.
- The Board has imparted training on "Monitoring and Analysis of Environmental Parameters from 8th to 30th November, 2018 to 20 numbers of participants under "Green Skill Development Programme (GSDP)" organized by the Centre for Environmental Studies (CES). The participants were given demonstration and hands-on training for sampling and analysis of water and wastewater samples, ambient air monitoring and analysis, source emission monitoring and analysis, noise monitoring, soil and hazardous waste sampling and analysis.
- Imparted training on "Ambient air pollutants effect and its measurement" to 81 MBBS students of All India Institute of Medical Science, Bhubaneswar.

- Four numbers of 1st year M.Sc. (Environmental Science) Students of Pondicherry University were guided for conducting their summer-internship work in the Central Laboratory.
- Eight numbers of M.Sc (Environmental Science) Students of Utkal University were guided for conducting their Dissertation work in the Central Laboratory.
- Imparted training on "Prevention & control of Vehicular Pollution" to 541 numbers of Traffic personnel at Traffic Training Institute, Bhubaneswar.

8.9.3 Observation of Important Days

❖ ***Earth Day***

The World Earth Day was celebrated on 22nd April, 2018 by Regional Offices of State Pollution Control Board, Odisha.

❖ ***World Environment Day***

The State Pollution Control Board, Odisha observed World Environment Day on 5th June, 2018 through 12 Regional Offices. For the year 2018, the theme of the World Environment Day was **"Beat Plastic Pollution"**. In this context, several programmes such as plantations, organizing debate / quiz/ rally / painting competitions followed by distribution of prizes, beach clean-up activities involving public /students of schools & colleges were conducted to create awareness for protection of environment.

Observation of World Environment Day by Regional Offices

RAYAGADA

BERHAMPUR

ROURKELA

KEONJHAR

BHUBANESWAR

KALINGANAGAR

PARADEEP

BALASORE

ANGUL

SAMBALPUR

CUTTACK

JHARSUGUDA

❖ *35h Foundation Day*

The 35th Foundation Day of the Board was observed on 15th September, 2018 at Jayadev Bhawan, Bhubaneswar. The function was presided by Sri R. Balakrishnan, IAS, Addl. Chief Secretary-cum-Development Commissioner, Govt. of Odisha & Chairman, State Pollution Control Board, Odisha and Sri S.C.Mohapatra, IAS, Additional Chief Secretary, F & E Department Govt. of Odisha was the Guest of Honor. Sri D. Biswal, IFS, Member Secretary, State Pollution Control Board, Odisha delivered the key note address on the occasion. Prof. Satyaban Jena, Retd. Prof. of Chemistry, Utkal University, Vanivihar delivered Prof. M. K. Rout Memorial Lecture on **"Green Chemistry"** *on* the occasion. Distinguished guests from various sectors like Government, Industries, Officers & Staff from Regional Offices & Head Office of the Board attended the function.

Chairman Delivering his Address During 35th Foundation Day

Prof. M.K. Rout Memorial Lecture by Prof. Satyaban Jena, Retd. Prof. of Chemistry Utkal Unversity Vani Vihar

The Newsletter **'Paribesh Samachar'** (April – June 2018), Report on Heat Island study in Angul-Talcher area (Vol-I) prepared by Centre for Atmospheric Science, IIT, Delhi and one Book on "Mangroves Atlas of Bhitarkanika", published by ICZMP, SPCB, Odisha in association with Department of Bio-technology & Bioinformatics, Sambalpur University, Odisha were released on the occasion.

Release of Book on 'Mangroves Atlas of Bhitarkaneka'

Release of Report on Heat Island Study in Angul-Talchea Area(Vol-I) prepared by Centre for Atmospheric Sciences, IIT, Delhi

The Board has instituted pollution control excellence/appreciation awards to encourage the industries/mines / health care units for adoption of adequate pollution control measures. The list of awardees for this year is as follows:

1. **Industries :**

   Pollution Control Excellence Award - M/s. National Aluminium Company Ltd., (Alumina Refinery), At- Damanjodi, Dist: Korapat .

   Pollution Control Appreciation Award – M/s. Suraj Products Ltd., At: Barpalli, Dist: Sundargarh.

2. **Mines:**

   Pollution Control Excellence Award - M/s. Katamati Iron Mines of M/s Tata Steel Limited, Dist: Keonjhar.

   Pollution Control Appreciation Award - M/s. T.R.B. Iron Ore Mines of M/s. Jindal Steel & Power Ltd., AT: Tensa, Dist: Sundargarh.

3. **Health Care Units:**

   Pollution Control Excellence Award - Community Health Centre (CHC) Mandasahi, Jagatsinghpur.

   Pollution Control Appreciation Award - Tata Steel Hospital, Joda, M/s. Tata Steel Limited, Keonjhar.

Pollution Control Excellence Award & Appreciation Award in Industries Categories

M/s. National Aluminium Company Ltd., (Alumina Refinery), At- Damanjodi,

M/s. Suraj Products Ltd., At: Barpalli, Dist: Sundargarh

Pollution Control Excellence Award & Appreciation Award In Mines Categories

M/S. Katamati Iron Mines of M/S Tata Steel Limited, Dist: Keonjhar.

M/S. T.R.B. iron ore mines of M/S. Jindal steel & Power Ltd., At: Tensa, Dist: Sundargarh

Pollution Control Excellence Award & Appreciation Award In Health Care Units

Community Health Centre (CHC), Mandasahi, Jagatsinghpur.

TATA Steel Hospital of M/S. Tata Steel Limited, Joda, Keonjhar

❖ INTERNATIONAL COASTAL CLEAN-UP DAY

The International Coastal Clean-up Day was observed by the Board on the Sea Beach, Puri, Konark, Chandipur, Gopalpur & Paradeep on 15th September, 2018 for creation of mass awareness on the protection and management of coastal environment involving District Administration, NGOs and volunteers etc.

Observation of International Coastal Clean-up Day by SPC Board

Puri Sea Beach

Konark Sea Beach

Gopalpur Sea Beach

Paradeep Sea Beach

Chandipur Sea Beach

❖ **WORLD OZONE DAY**

World Ozone day was observed by the Board through Regional Offices conducting meeting & workshop etc.

❖ **NATIONAL POLLUTION PREVENTION DAY**

The National Pollution Prevention Day was observed by the Board through Regional Offices on 2nd December 2018 by conducting mass rally, meetings, workshops etc. for creation of mass awareness on pollution prevention and protection of environment, involving different NGOs and volunteers.

8.10 AWARENESS ACTIVITES

- For creation of awareness amongst general public, the Board regularly publishes advertisements relating to environmental issues in different periodicals / newspapers / souvenirs.
- The World Earth Day was celebrated on 22nd April, 2018 by Regional Offices of State Pollution Control Board, Odisha.
- The Board observed the World Environment Day on 5th June' 2018 through 12 Regional Offices to create awareness on environmental protection. Messages on protection of environment were given to the public through meetings, mass campaign, paintings, debates & plantations etc.
- The 35th Foundation Day of the Board was observed on 15th Sept, 2018 at Jaydev Bhawan, Bhubaneswar followed by release by newsletters and books. Prof. Satyaban Jena, Retd. Professor of Chemistry, Utkal University, Vanivihar delivered Prof. M.K. Rout Memorial Lecture on **Green Chemistry**.
- The International Coastal Clean-up Day was observed by the Board on the Sea Beaches of Puri, Konark, Chandipur, Gopalpur & Paradeep on 15th Sept, 2018 for creation of mass awareness on protection and management of environment involving District Administration, different NGOs & Volunteers.
- During Deepawali festival awareness campaign was organized in & around Bhubaneswar and Cuttack for creating awareness among the public on effect of crackers on air pollution & noise pollution.
- An awareness meeting was conduted by Regional Office, Sambalpur on 05.09.2018 at Bargarh involving the Stone Crusher Association, Bargarh on Pollution Control Measures in Stone Crusher Units.

8.11 PUBLICATIONS

The Board has published the following Book & Reports during April, 2018 to March, 2019.

- Newsletters "Paribesh Samachar" i.e. (Jan–Mar. 2018, April-June, 2018, July – December, 2018).
- "Environmental Status Report- 2015-2017" for the coastal stretches of Paradeep, Gahirmatha-Bhitarkanika and Dhamra in the Bay of Bengal, India by ICZMP, SPCB, Odisha.
- Report card on Paradeep-Gahirmatha-Dhamra Ecosystem-2017 by ICZMP, SPCB, Odisha.
- "Mangroves Atlas of Bhitarkanika" was published by ICZMP, SPCB, Odisha in association with Department of Biotechnology & Bioinformatics, Sambalpur University, Odisha.

8.12 EMPANELLED ENVIRONMENTAL CONSULTANTS

In the year 2018-19, total 07 nos. of consultants were empanelled as environmental consultant with the Board. Out of these seven consultants, 03 consultants were empanelled under 'A' Category and 04 consultants were empanelled under 'B' category. The name and address of these consultants, category under which they have been empanelled and validity period of their empanelment certificate are given in Table-8.7.

Table-8.7 Status of Environmental Consultants for the Year 2018-19

Category-A

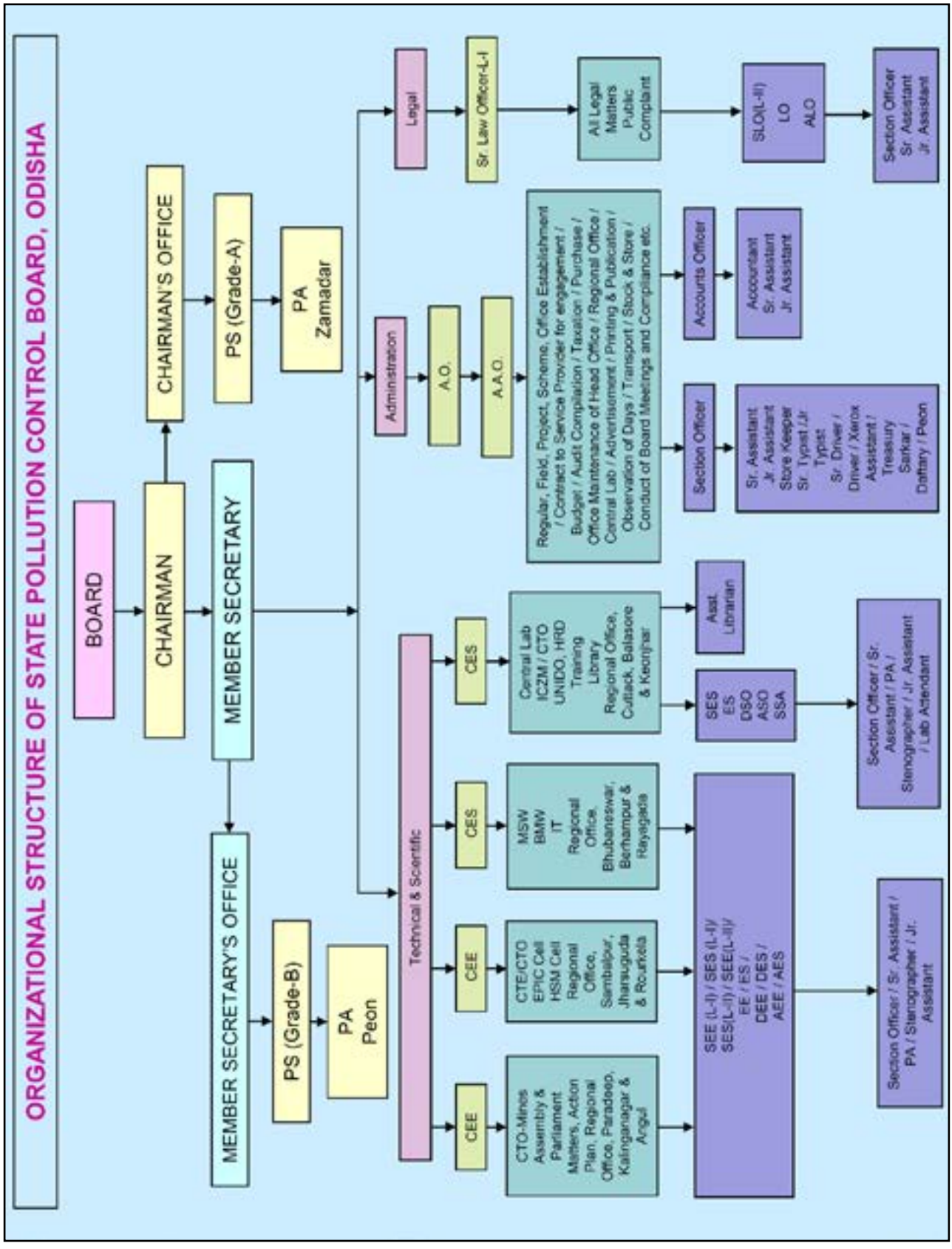
Sl. no	Name of the Consultant	Category	Validity Period
1	**M/s Bhagavathi Ana Labs Pvt. Ltd** Plot No.7-2-C 7 & 8/4 & 14,Industrial Estate, Sanathnagar, Hyderabad-500018 Phone No:- 91-40-23803800/23811535 Email Id: - shyam.sundar@in.bureauveritas.com/ bhavna.polimera@in.bureauveritas.com	A	27.07.2018 to 26.07.2021
2	**M/s B.S.Envi-Tech Pvt. Ltd ,** 12-13-1270/71/73,4th Floor, Amity Ville, St. Ann's Road, Tarnaka, Secunderabad-500017 Phone – +914049783062/27016806 E-mail – bsenvitech@gmail.com	A	23.03.2019 to 22.03.2022
3	**M/s Vision labs** H.No 16-11-23/37/A, Flat No.205, 2nd Floor,Opp. R.T.A Office, N-mart Building, Musarambagh, Malakpet, Hyderabad-500036 Phone – 040-24544320 E-mail – info@visonlabs.com	A	30.03.2019 to 29.03.2022

Category-B

Sl. no	Name of the Consultant	Category	Validity Period
1	M/s Sai BioCare Pvt. Ltd, Plot No-1789/4898, 2nd floor, Nuasahi Nayapalli, Bhubaneswar-751012 Phone No:- 0674-2565195 Email Id: - info@saibiocare.com	B	10.08.2018 to 09.08.2021

Sl. no	Name of the Consultant	Category	Validity Period
2	M/s Enviro Care Technocrats Pvt. Ltd, 201, New Opera House Nr.CNG Pump & Civil Hospital Ring Road, Khatodara, Surat-395002 Phone No:- 0261-2630781/09825125122 Email Id: - info@envirocare.net.in	B	06.03.2019 to 05.03.2022
3	**M/s Ecological Development Consultancy Pvt. Ltd,** Plot No-1666, Vibaba Estate Lane Nilakantheswar Marg, Delta Colony, Baramunda Bhubaneswar-751003 Phone No:- 0674-2565226,08763213647 Email Id: - edcbbsr@gmail.com	B	11.03.2019 to 10.03.2022
4	**M/s. Orbital Infrastructure Consultancy & Research Pvt.Ltd.,** Plot No. 1134, Mahanadi Vihar, Cuttack – 753004 Phone No:- (0671) 2443588, 2443408 E-mail : orbital6@hotmail.com	**B**	23.03.2019 to 22.03.2022

ANNEXURE-I


ORGANIZATIONAL STRUCTURE OF STATE POLLUTION CONTROL BOARD, ODISHA
BOARD
CHAIRMAN
CHAIRMAN'S OFFICE
PS (Grade-A)
PA
Zamadar
MEMBER SECRETARY
MEMBER SECRETARY'S OFFICE
PS (Grade-B)
PA
Peon
Administration
A.O.
A.A.O.
Legal
Sr. Law Officer-L-I
All Legal Matters Public Complaint
SLO(L-II) LO ALO
Section Officer Sr. Assistant Jr. Assistant
Regular, Field, Project, Scheme, Office Establishment / Contract to Service Provider for engagement / Budget / Audit Compilation / Taxation / Purchase / Office Maintenance of Head Office / Regional Office / Central Lab / Advertisement / Printing & Publication / Observation of Days / Transport / Stock & Store / Conduct of Board Meetings and Compliance etc.
Accounts Officer
Accountant Sr. Assistant Jr. Assistant
Section Officer
Sr. Assistant Jr. Assistant Store Keeper Sr. Typist /Jr Typist Sr. Driver / Driver / Xerox Assistant / Treasury Sarkar / Daftary / Peon
Technical & Scientific
CES
Central Lab ICZM / CTO UNIDO, HRD Training Library Regional Office, Cuttack, Balasore & Keonjhar
Asst. Librarian
SES ES DSO ASO SSA
Section Officer / Sr. Assistant / PA / Stenographer / Jr. Assistant / Lab Attendant
CES
MSW BMW IT Regional Office Bhubaneswar, Berhampur & Rayagada
CEE
CTE/CTO EPIC Cell HSM Cell Regional Office, Sambalpur, Jharsuguda & Rourkela
CEE
CTO-Mines Assembly & Parliament Matters, Action Plan, Regional Office, Paradeep, Kalinganagar & Angul
SEE (L-I) / SES (L-I)/ SES(L-II) / SEE(L-II)/ EE / ES / DEE / DES / AEE / AES
Section Officer / Sr. Assistant / PA / Stenographer / Jr. Assistant

ANNEXURE-II

RATE CHART FOR SAMPLING AND ANALYSIS OF ENVIRONMENTAL SAMPLES
(Office Order No. 24287 dated 07.11.2008)

A. SAMPLING CHARGES

(I) Sampling charges for Ambient Air/ Fugitive emission samples

Sl. No.	Type of sampling	Charges in Rs.
1.	Sampling (upto each 8 hrs) for suspended particulate matter and gaseous pollutants	2000.00
2.	Sampling (24 hrs) for suspended particulate matter and gaseous pollutants	6000.00
3	Sampling of volatile organic compounds (VOCs) / Benzene Toluene Xylene (BTX)	2000.00
4	Sampling of Poly Aromatic Hydrocarbons (PAHs)	2500.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(II) Source Emission Monitoring / Sampling Charges

Sl. No.	Type of Sampling	Charges in Rs.
(a)	Sampling/ measurement of velocity, flow rate, temperature and molecular weight of Flue Gas (each specific location/ each sample in duplicate for the mentioned parameter)	5500.00
(b)	Sampling of SO_2 / NO_2	2000.00
(c)	Sampling of PAHs	3000.00
(d)	Sampling of VOCs / BTX	3500.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(III) Noise Monitoring

Type of Monitoring	Charges in Rs.
First Monitoring	4000.00
Each Subsequent Monitoring within same premises	2000.00
For 08 hours Continuous Monitoring or more in a day	10,000.00

Note: (i) Transportation charges will be separate as per actual basis.

(IV) SAMPLING CHARGES FOR WATER & WASTEWATER SAMPLES

Sl. No.	Type of sampling	Charges in Rs.
1.	**GRAB SAMPLING:**	
	1) Grab sampling/ samples/ place	550.00
	2) For every additional Grab sampling / same place (at same point)	250.00

Sl. No.	Type of sampling	Charges in Rs.
2.	**COMPOSITE SAMPLING:**	
	1) Composite sampling/source/place upto 8 hrs.	1000.00
	-do- upto16 hrs.	2000.00
	-do- upto 24 hrs.	3000.00
	2) For every additional composite sampling/same place but different source upto 8 hrs.	
	-do- upto 16 hrs	550.00
	-do- upto 24 hrs	1100.00
		1650.00
3.	Flow rate measurement/ source	
	-do- - Once	400.00
	- Every additional -	150.00

Note: (i) Transportation charges will be separate as per actual basis.
(ii) Sample analysis charges of respective parameters are separate as per list.

(V) Sampling charges for Soil samples

Type of Sampling	Charges in Rs.
Grab sampling/ sample/ place	600.00
For additional Grab sampling / same place	300.00

Note: (i) Transportation charges will be separate as per actual basis.
(ii) Sample analysis charges of respective parameters are separate as per list.

(VI) Hazardous Waste Sample collection charges at the premises of Industry/ Import site/ Disposal site

Type	Charges in Rs.
Integrated sample collection charges	1000.00

Note: (i) Transportation charges will be separate as per actual basis.
(ii) Sample analysis charges of respective parameters are separate as per list.

B. ANALYSIS CHARGES

1. Analysis charges of Ambient Air/ Fugitive Emission Samples

Sl. No	Parameters (Air)	Analysis charges per sample in Rs.
1	Ammonia	600.00
2	Analysis using dragger (per tube)	400.00
3	Benzene, Toluene, Xylene (BTX)	1000.00
4	Carbon Monoxide	600.00
5	Chlorine	600.00
6	Fluoride (gaseous)	600.00
7	Fluoride (particulate)	600.00
8	Hydrogen Chloride	600.00
9	Hydrogen Sulphide	600.00

Sl. No	Parameters (Air)	Analysis charges per sample in Rs.
10	Lead & Other Metals (per metal)	As mentioned in respective group at clause 5.0
11	NO_2	600.00
12	Ozone	1000.00
13	Poly Aromatic Hydrocarbons (PAHs)	As mentioned in respective group at clause 5.0
14	Suspended Particulate Matter (SPM)	600.00
15	Particulate Matter ($PM_{2.5}$)	1000.00
16	Respirable Suspended Particulate Matter (PM_{10})	600.00
17	Sulphur Dioxide	600.00
18	Volatile Organic Carbon	2000.00
19	Trace metals on air, filter paper using ED-XRF Aluminium, Antimony, Arsenic, Barium, Bromine, Cadmium, Calcium, Cesium, Chlorine, Chromium, Cobalt, Copper, Gallium, Germanium, Gold, Iodine, Iron, Lanthanum, Lead, Magnesium, Manganese, Molybdenum, Nickel, Palladium, Phosphorous, Potassium, Rubidium, Rutherfordium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Tellurium, Tin, Titanium, Tungsten, Vanadium, Ytterbium and Zinc	3000.00 Per filter paper
20	Water extractable ions in air particulate matter using Ion Chromatograph (IC) i) Processing / pretreatment charge per sample (filter paper) ii) Cations (Na^+, NH_4^+, K^+, Ca^{++}, & Mg^{++}) and Anions (F^-, Br^-, Cl^-, NO_3^-, NO_2^-, SO_4^{--}& PO_4^{---})	 300.00 1200.00 (for 12 ions)
21	Organic and Elemental Carbon (OC/EC) on quartz filter paper	2000.00

2. Analysis charges for Source Emission Parameters

Sl.No.	Parameters	Analysis charges per test in Rs.
1	Acid mist	600.00
2	Ammonia	600.00
3	Carbon Monoxide	600.00
4	Chlorine	600.00
5	Fluoride (Gaseous)	600.00
6	Fluorides (Particulate)	600.00
7	Hydrogen Chloride	600.00
8	Hydrogen Sulphide	600.00
9	Oxides of Nitrogen	600.00
10	Oxygen	500.00
11	Polycyclic Aromatic Hydrocarbons (Particulate)	As mentioned in respective group at clause 5.0
12	Suspended particulate matter	600.00
13	Sulphur Dioxide	600.00
14	Benzene Toluene Xylene (BTX)	1500.00
15	Volatile Organic Compounds (VOC)	3000.00

3. Ambient Air Quality Monitoring using on-line monitoring instruments by Mobile Van

Parameters	Charges in Rs.
PM_{10}, $PM_{2.5}$, SO_2, NO_x, SPM, CO along with Meteorological data viz. temperature, Humidity, wind speed, wind direction	Rs.3,500/hour (minimum charges Rs.15,000/-) + Rs.50.00/ km run of the van for 24 hours monitoring.

4. Auto Exhaust Monitoring – One time checking of Vehicular Exhaust

SL. NO.	TYPE OF VEHICLES	CHARGES IN RS. (INCLUDING COST OF THE COMPUTERIZED PHOTO)
1	2 & 3 WHEELERS	40.00
2	LIGHT MOTOR VEHICLES	60.00
3	MEDIUM AND HEAVY MOTOR VEHICLES	100.00

5. ANALYSIS CHARGES OF WATER AND WASTEWATER SAMPLES

Sl.No	Parameters	Analysis charges per test in Rs.
PHYSICAL PARAMETERS		
1	Conductivity	60.00
2	Odour	60.00
3	Sludge Volume index (S.V.I)	200.00
4	Solids (dissolved)	100.00
5	Solids (fixed)	150.00
6	Solid (Volatile)	150.00
7	Suspended Solids	100.00
8	Temperature	60.00
9	Total Solids	100.00
10	Turbidity	60.00
11	Velocity of Flow (Current Meter)	200.00
12	Velocity of Flow (other)	550.00
CHEMICAL PARAMETERS		
1.	Acidity	100.00
2.	Alkalinity	100.00
3.	Ammonical Nitrogen	200.00
4.	Bicarbonate	100.00
5.	Biochemical Oxygen Demand (BOD)	600.00
6.	Bromide	100.00
7.	Calcium (Titrimetric)	100.00
8.	Carbon dioxide	100.00
9.	Carbonate	100.00
10.	Chloride	100.00
11.	Chlorine Demand	200.00
12.	Chlorine Residual	100.00
13.	Chemical Oxygen Demand (COD)	350.00

Sl.No	Parameters	Analysis charges per test in Rs.
14.	Colour	40.00
15.	Cyanide	350.00
16.	Detergents	200.00
17.	Dissolved Oxygen (DO)	100.00
18.	Fluoride	200.00
19.	Free ammonia	260.00
20.	H. Acid	350.00
21.	Hardness (Calcium)	100.00
22.	Hardness (Total)	100.00
23.	Iodide	100.00
24.	Nitrite – Nitrogen	200.00
25.	Nitrate – Nitrogen	200.00
26.	Percent Sodium	600.00
27.	Permanganate Value	200.00
28.	pH	60.00
29.	Phosphate (Ortho)	200.00
30.	Phosphate (Total)	350.00
32.	Salinity	100.00
33.	Sodium Absorption Ratio (SAR)	600.00
35.	Settleable Solids	100.00
36.	Silica	200.00
37.	Sulphate	150.00
38.	Sulphide	200.00
39.	Sulphite	250.00
40.	Total Kjeldahl Nitrogen (TKN)	350.00
41.	Urea Nitrogen	350.00
42.	Cations (Na^+, NH_4^+, K^+, Ca^{++}, & Mg^{++}) and Anions (F^-, Br^-, Cl^-, NO_3^-, NO_2^-, SO_4^{--}& PO_4^{---}) in surface and ground water samples using Ion Chromatograph	1200.00 (for 12 ions)
Metals		
	Processing / pre treatment charge per sample	500.00
1.	Aluminium	300.00
2.	Antimony	300.00
3.	Arsenic	300.00
4.	Barium	300.00
5.	Beryllium	300.00
6.	Boron	300.00
7.	Cadmium	300.00
8.	Chromium Hexavalent	200.00
9.	Chromium Total	300.00
10.	Cobalt	300.00
11.	Copper	300.00

Sl.No	Parameters	Analysis charges per test in Rs.
12.	Iron	300.00
13.	Lead	300.00
14.	Magnesium	200.00
15.	Manganese	300.00
16.	Mercury (Processing and Analysis)	800.00
17.	Molybdenum	300.00
18.	Nickel	300.00
19.	Potassium	200.00
20.	Selenium	300.00
21.	Silver	300.00
22.	Sodium	200.00
23.	Strontium	300.00
24.	Tin	300.00
25.	Vanadium	300.00
26.	Zinc	300.00

Sl.No	Parameters	Analysis charges per test in Rs.
Organo Chlorine Pesticides (OCPs)		
	Processing / pre treatment charge per sample	1000.00
1.	Aldrine	400.00
2.	Dicofol	400.00
3	DIeldrin	400.00
4	Endosulfan-1	400.00
5	Endosulfan-2	400.00
6	Endosulfan-Sulfate	400.00
7	Heptachlor	400.00
8	Hexachlorobenzene (HCB)	400.00
9	Methoxychlor	400.00
10	o,p DDT	400.00
11	p,p'- DDD	400.00
12	p,p'- DDT	400.00
13	p'p DDE	400.00
14	a-HCH	400.00
15	ß-HCH	400.00
16	γ-HCH	400.00
17	δ-HCH	400.00
Organo Phosphorous Pesticides (OPPs)		
	Processing / pre treatment charge per sample	1000.00
18	Chlorpyriphos	400.00

Sl.No	Parameters	Analysis charges per test in Rs.
19	Dimethoate	400.00
20	Ethion	400.00
21	Malathion	400.00
22	Monocrotophos	400.00
23	Parathion-methyl	400.00
24	Phorate	400.00
25	Phosphamidon	400.00
26	Profenophos	400.00
27	Quinalphos	400.00
Synthetic Pyrethroids (SPs)		
	Processing / pre treatment charge per sample	1000.00
28	Deltamethrin	400.00
29	Fenpropethrin	400.00
30	Fenvalerate	400.00
31	a-Cypermethrin	400.00
32	β-Cyfluthrin	400.00
33	γ-Cyhalothrin	400.00
Herbicides		
	Processing / pre treatment charge per sample	1000.00
34	Alachlor	400.00
35	Butachlor	400.00
36	Fluchloralin	400.00
37	Pendimethalin	400.00
Polycyclic Aromatic Hydrocarbons (PAHs)		
	Processing / pre treatment charge per sample	1000.00
38	Polycyclic Aromatic Hydrocarbon	750.00
39	Acenaphthene	400.00
40	Acenaphthylene	400.00
41	Anthracene	400.00
42	Benzo(a)anthracene	400.00
43	Benzo(a)Pyrene	400.00
44	Benzo(b)fluoranthene	400.00
45	Benzo(e)Pyrene	400.00
46	Benzo(g,h,i) Perylene	400.00
47	Benzo(k)fluoranthene	400.00
48	Chrysene	400.00
49	Dibenzo(a,h)anthracene	400.00

Sl.No	Parameters	Analysis charges per test in Rs.
50	Fluoranthene	400.00
51	Fluorane	400.00
52	Indeno (1,2,3-cd)pyrene	400.00
53	Naphthalene	400.00
54	Perylene	400.00
55	Phenanthrene	400.00
56	Pyrene	400.00
Polychlorinated Biphenyls (PCBs)		
	Processing / pre treatment charge per sample	1000.00
57	Aroclor 1232	400.00
58	Aroclor 1242	400.00
59	Aroclor 1248	400.00
60	Aroclor 1254	400.00
61	Aroclor 1260	400.00
62	Aroclor 1262	400.00
Trihalomethane (THM)		
	Processing / pre treatment charge per sample	800.00
63	Bromodichloromethane	400.00
64	Bromoform	400.00
65	Chloroform	400.00
66	Dibromochloromethane	400.00
Other Organic Parameters		
67	Adsorbable Organic halogens (AOX)	2000.00
68	Tanin/ Lignin	350.00
69	Oil and Grease	200.00
70	Phenol	200.00
71	Total Organic carbon (TOC)	500.00
72	Volatile organic acids	350.00
BIOLOGICAL TEST		
1.	Bacteriological Sample Collection	200.00
2.	Benthic Organism Identification and Count (each sample)	600.00
3.	Benthic Organism Sample collection	1000.00
4.	Chlorophyll Estimation	600.00
5.	E. Coli (MFT technique)	400.00
6.	E. Coli (MPN technique)	350.00
7.	Fecal Coliform (MFT technique)	400.00
8.	Fecal Coliform (MPN technique)	350.00
9.	Fecal Streptococci (MFT technique)	450.00

Sl.No	Parameters	Analysis charges per test in Rs.
10.	Fecal Streptococci (MPN technique)	400.00
11.	Plankton (sample collection)	250.00
12.	Plankton (Phytoplankton) count	600.00
13.	Plankton (Zooplankton) count	600.00
14.	Standard Plate Count	200.00
15.	Total Coliform (MFT technique)	400.00
16.	Total Coliform (MPN technique)	350.00
17.	Total Plate Count	350.00
18.	Toxicological Bio-assay (LC_{50})	2800.00
19.	Toxicological –Dimensionless toxicity test	1600.00

Note: 1. Sampling charges for water and waste water samples are separate as specified in Clause A(IV), but subject to minimum of Rs.700/- irrespective of number of samples.

2. Transportation charges are separate on actual basis.

6. Analysis charges of Soil/ Sludge/ Sediment/ Solid waste/ Solid samples

Sl.No.	Parameters	Analysis charges per test in Rs.
1	Ammonia	300.00
2	Bicarbonate	200.00
3	Boron	400.00
4	Bulk Density	100.00
5	Calcium	150.00
6	Calcium Carbonate	350.00
7	Cation Exchange Capacity (CEC)	400.00
8	Chloride	150.00
9	Colour	100.00
10	Electrical Conductivity (EC)	100.00
11	Exchangeable Sodium Percentage (ESP)	550.00
12	Fluoride	200.00
13	Gypsum requirement	350.00
14	H. Acid	400.00
15	Heavy metal	As mention in respective group at clause 5.0
16	Trace metals using ED-XRF Aluminium, Antimony, Arsenic, Barium, Bromine, Cadmium, Calcium, Cesium, Chlorine, Chromium, Cobalt, Copper, Gallium, Germanium, Gold, Iodine, Iron, Lanthanum, Lead, Magnesium, Manganese, Molybdenum, Nickel, Palladium, Phosphorous, Potassium, Rubidium, Rutherfordium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Tellurium, Tin, Titanium, Tungsten, Vanadium, Ytterbium and Zinc per sample	4000.00
17.	Magnesium	300.00
18.	Mechanical Soil analysis(soil texture)	150.00
19.	Nitrate	300.00
20.	Nitrite	300.00
21.	Nitrogen available	350.00
22.	Organic Carbon/ Matter (chemical method)	350.00
23.	Oil and Grease	200.00

Sl.No.	Parameters	Analysis charges per test in Rs.
24.	Polycyclic Aromatic Hydrocarbons (PAH)	As mention in respective group at clause 5.0
25.	Polychlorinated Biphenyls (PCBs)	As mention in respective group at clause 5.0
26.	Pesticides	As mention in respective group at clause 5.0
27.	pH	100.00
28.	Phosphorous (available)	400.00
29.	Phosphate(ortho)	300.00
30.	Phosphate(total)	400.00
31.	Potash(Available)	200.00
32.	Potassium	300.00
33.	SAR in Soil extract	650.00
34.	Sodium	300.00
35.	Soil Moisture	100.00
36.	Soil Porosity	100.00
37.	Sulphate	200.00
38.	Sulphur	350.00
39.	Total Kjehldhal Nitrogen (TKN)	400.00
40.	TOC	550.00
41.	Total Water Soluble Salts	200.00
42.	Water Holding Capacity	100.00

Note: (i) Sampling charges for soil samples are as specified in Clause A (V).
(ii) Transportation charges are separate on actual basis

7. Analysis charges for Hazardous Waste samples

Sl. No.	Parameters	Analysis Charges per test in Rs.
1.	Preparation of Leachate (TCLP extract / Water Extract)	1000.00
2.	Determination of various parameters in Leachate	As mention in respective group at clause 5.0
3.	Determination of various parameters in Waste (Total)	Soil Sample Analysis Charges
3.	Flash point/ Ignitibility	550.00
4.	Reactivity	550.00
5.	Corrosivity	550.00
6.	Measurement of Toxicity	
	- LC_{50}	2800.00
	- Dimensionless Toxicity	1600.00
7.	Total Organic Carbon	500.00
8.	Adsorbable organic Halogen (AOx)	2000.00

8. AQC Participation Fees :

To be charged by the Board from respective recognized laboratories for Analytical Quality Control Exercise (AQC) samples.

1	Laboratories of Govt./Semi-Govt. / Public sector undertaken/Autonomous bodies	18000.00
2	Private Sector laboratories	18000.00

ANNEXURE-III

Staff Strength

Sl. No.	Name of the Post	Sanctioned Post	Staff in position
(A)	**Cadre of Scientist**		
1	Chief Environmental Scientist	**2**	**2**
2	Senior Enviornmental Scientist (L-I)	3	2
3	Senior Enviornmental Scientist (L-II)	3	1
4	Environmental Scientist	48	21
5	Deputy Environmental Scientist		0
6	Assistant Environmental Scientist		12
(B)	**Cadre of Engineer**		
7	Chief Environmental Engineer	**2**	**2**
8	Senior Environmental Engineer (L-I)	3	3
9	Senior Environmental Engineer (L-II)	3	3
10	Environmental Engineer	46	12
11	Deputy Environmental Engineer		0
12	Assistant Environmental Engineer		21
(C)	**Cadre of Laboratory Officials**		
13	Assistant Scientific Officer	7	**6**
14	Senior Scientific Assistant	15	8
(D)	**Administrative Cadre**		
15	Administrative Officer	1	0
16	Additional Administrative Officer	1	1
17	Accounts Officer	2	2
18	Section Officer	8	7
19	Accountant	5	0
20	Senior Assistant	13	12
21	Junior Assistant	18	7
(E)	**Legal Personnel Cadre**		
22	Senior Law Officer (L-I)	1	1
23	Senior Law Officer (L-II)	1	0
24	Law Officer	1	1
25	Assistant Law Officer	1	0
(F)	**Stenographer Cadres**		
26	Private Secretary (Gr. A)	1	1
27	Private Secretary (Gr. B)	2	2

Sl. No.	Name of the Post	Sanctioned Post	Staff in position
28	Personal Assistant	8	7
29	Senior Stenographer	9	0
30	Junior Stenographer	7	1
(G)	**Others**		
31	Head Driver	1	0
32	Sr. Driver	3	3
33	Driver	9	6
34	Sr. Typist	2	2
35	Jr. Typist	8	5
36	Diarist	1	1
37	Peon	21	18
38	Laboratory Attendant	10	8
39	Watchman-cum-Sweeper	5	4
40	Watchman	2	2
41	Daftary	1	1
42	Zamadar	1	1
43	Treasury Sarkar	1	1
44	Record Supplier	1	1
45	Lift Operator	1	1
46	Xerox Asst.	1	1
47	Store Keeper	1	1
48	Asst. Librarian	1	1
49	Library Attendant	1	1
TOTAL		**282**	**197**

STATE POLLUTION CONTROL BOARD, ODISHA
A/118, NILAKANTHA NAGAR, UNIT-VIII
BHUBANESWAR