



**GOVERNMENT OF MAHARASHTRA  
WATER RESOURCES DEPARTMENT**

**HYDROLOGY PROJECT (SW)  
Executive Engineer, Hydrology Project Division, Nagpur**



**WATER QUALITY LAB LEVEL-II, NAGPUR**

**ANNUAL REPORT YEAR 2010-2011**

**Executive Engineer  
Hydrology Project Division, Nagpur**

## PREFACE

Water is a precious national asset. It is a major constituent of all living beings. Water is available in two basic forms i.e. Surface water and Ground Water.

This report includes water quality data in Godavari Basin & Tapi Basin for the period of June 2010 to May 2011 by the agency M/s. Ashwamedh Engineers & Consultants Co. Op. So. Ltd. as awarded a contract towards Operation and Maintenance of Water Quality Lab Level-II, Nagpur for the said period. The data has been interpreted to know the affected locations.

It is an event of great pleasure to hand over this precise report on analysis of water samples in WQ Laboratory Level . II at Nagpur which is established in Jal Vidnyan Bhavan. It is also a matter of pride to state that this Laboratory is the first in Hydrology Project (SW) to be accredited with ISO 9001:2008 for implementation of Quality Management System (QMS).

This booklet attempts to briefly describe an over view and general conclusion based on the basis of water quality data of water samples collected from selected locations for defined frequencies for the reported period.

It is expected that this booklet will provide an idea in brief about Water Quality Lab. Level -II at Nagpur. Our efforts can always be updated through valuable suggestions.

**(P.P.Mendhe)**  
Executive Engineer  
Hydrology Project Division  
Nagpur. ( Maharashtra)



# Annual Report

## Working through Water Quality Lab Level- II Nagpur for the Year 2010- 2011

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# CHAPTER – I

## EXECUTIVE SUMMARY

## CHAPTER-1

### EXECUTIVE SUMMARY

#### **Annual Report On Water Quality Monitoring through Water Quality Lab Level-II, Nagpur for the Year 2010-2011**

##### **1.1 Preamble:**

The water quality monitoring in the area of surface water is performed in order to determine the quality of water. Various parameters are analyzed in the laboratory and 6 parameters are tested at field level. All these tasks recorded are utilized for preparing the Annual Report by performing some specific exercise. This data is considered in order to specify the quality of water at each location. This also helps to determine the pollution level or concentration in each source of water at each station.

##### **1.2 Water Quality Monitoring - Objectives**

Observations of analysis of physical & chemical parameters as per Uniform Protocol for Water Quality Monitoring 2005+ for each location followed by Operation and Maintenance of Water Quality Laboratory Level-II, Nagpur as per Standard Guidelines and mandates including collection, transportation and analysis of samples , data entry in SWDES Software and preparation of the said Annual Report as per specific guidelines issued by Superintending Engineer, Hydrology Project Circle( Collection), Nashik,

##### **1.3 Water Quality Monitoring - Scope**

The Annual Report is prepared for the year 2010-2011. The Table below shows the number of sample analyzed during the reported period. In order to study water quality status station wise, all locations covered under this lab during the year 2010-2011 are considered.

## SAMPLES ANALYSED DURING THE REPORTING PERIOD

Sr. No.	Year	Ground Sample		Baseline Sample		Dam (Reservoir) Sample		Total
		First Round	Second Round	First Round	Second Round	First Round	Second Round	
1	2010-2011	10	79	13	36	4	92	234
Total Samples analyzed during reporting period <b>234</b>								

Seasonal averages of all analyzed parameters are calculated for study of seasonal water quality trend at each location.

### **1.4 Methodology:**

Analysis of Physical and Chemical parameters is done in the laboratory on the basis of Standard Analytical Methods, Instrument Operating Instructions, HIS Manuals, and APHA, 21st Edition 2005.

Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and is entered in SWDES Software for Water Quality Data Entry. Further the data is sent to State Data Center for further dissemination to user end.

Furthermore to get an idea of about data generated for the period it is decided and instructed to analyze the generated data for the said period in the form of Annual report with the help of various tools in SWDES Software to find out critical parameters and critical locations in the jurisdiction of this Lab.

## Results and Observations

### River Wardha

The water quality of River Wardha is Monitored at Four Locations vize, Drugwada, WarudBagaji, SoitDindora & Dhaba. The water quality of River Wardha does not meet the required quality criteria. The Water quality trend shows a high organic pollution at station Dhaba. BOD of Dhaba is found to be more than 2 mg/L during all seasons and is quit high with respect the limit for class-A waterbody 2 mg/L.

The DO of Dhaba found slightly Lower than Normal Limit in all seasons. The BOD at other stations except Drugwada is also found more than 2 mg/L. An increasing trend is found in the BOD at Dhaba when annual average values for last three years are compared. The insufficient DO in the Water body can result in anoxic conditions in the waterbody and can harm the flora and fauna in the region seriously. The alkalinity of The Water is slightly above a BIS (IS 10500: 1993) drinking water standard (desirable) of 200 mg/L at all stations except Drugwada. Also the concentration of colliform bacteria is high at all stations during all seasons and very high during rainy season at stations Dindora and Dhaba.

### River Purna

The water quality of the River Purna is Monitored at three Locations vize, Vishroli, and Manasgaon. The Water quality trend shows river is moderately polluted. BOD in the riverbody has a value more than 2 mg/L at all stations monitored and in all the seasons. DO in the waterbody is found Low during summer season but is within the limits during rest of year. The Bacterial pollution in the water is found to be high enough to cross specified limit by CPCB. The water quality does not fulfill the criteria for safe

### River Kanhan

The River water quality of River Kanhan is Monitored at two Locations vize, Temburdoh & Mathani. The water quality data reveals that the quality of the water of the River is deteriorating at station Mathani. In respect to the organic load, the water quality is found to be poor, which can be seen from the higher values of BOD. The colliform bacteria in the water are found in high concentration compared to the specified limits at all stations. pH of the water is within the limits of the BIS and CPCB.



## **River Penganga**

The water Quality of the River Penganga is Monitored at Four Locations vize, Kolgaon & Saiphal. The Water of River Penganga shows moderate pollution. The BOD is found more than 2 mg/L at all stations during all seasons. Colliform bacterial density at all stations is higher than the specified standard during all seasons. Alkalinity of the Water is found more than a limit of 200 mg/l specified by BIS The above factors prevents the use of water for drinking without any conventional treatment.

drinking water.

## **River Wainganga**

The water Quality of river Wainganga is monitored at four locations viz. Deori, Kardha, wadsa and Wagholibuti, Tha Data reveals that, the water Quality of the River does not meet the criteria for class-A waterbody. The BOD at station wadsa and also WagholiBulti are found more than 3 mg/L during most of the year. It shows A higher degree of organic pollution is observed at station Wadsa and WagholiBulti with respect to other Locations and is evidenced by the indicated values of BOD. at station wadsa and WagholiBulti of the year 10-11. Concentration of Colliform bacteria is high in all seasons at three Locations , Deori, Kardha and Wadsa and it makes the water unsafe for drinking purpose. The DO Values at all stations lies above 6 mg/L. The Alkalinity of Location Kardha shows slightly higher than 200 mg/L as compared to other Locations.

## **River Mun**

The water quality of River Mun is Monitored at two Locations Kawatha & Taklikhetri.

The water in the riverbody is also saline in nature. High organic pollution is observed at station Taklikhetri which is indicated by high values of BOD and COD. The bacterial pollution at all stations is high enough to make unsafe for drinking purpose without any conventional treatment.



## **River Chandrabhaga**

The water quality of river chandrabhaga was monitored at station Daryapur. The river Chandrabhaga at Daryapur is grossly polluted. High BOD and COD values are observed during all seasons and particularly during peak summers. This is an indicator of high organic pollution in the riverbody. The high organic contents in the water has resulted in the depletion of DO level below a alarming concentration of 4 ppm; and in some instances during peak summers the values had reached upto 1 ppm. The very low DO during in the water is insufficient for the survival of the aquatic life. The conditions are tending to become anaerobic. The high concentration of colliform bacteria of both faecal and non faecal origin was found very high. This is a strong indicator of urban pollution and discharge of city sewage in the waterbody.

## **WATER QUALITY OF RESERVOIRS**

The Water Quality of Four reservoirs (Dams) namely Pench, Upperwardha, Katepurna and Chapdoh which are used as a source of drinking water is monitored by the water quality Lab Level-II, Nagpur. The BOD of all reservoirs is slightly above the specified limit of 2 mg/L, and at chapdoh it is found slightly higher than at others. Higher values are obtained during summer and may be due to the increase in floral activities during summer. Colliform bacteria are found to be crossing the limit of IS 10500 for drinking water at all stations but it is within the CPCB limits at many instances.

## 1.6 Conclusion

From the results, it is observed that, these rivers are polluted to varying extent. The increasing urbanization and industrialization in the area is affecting the quality of the water to a great extent. The physicochemical as well as bacteriological water quality of these river systems is not satisfactory and this can further deteriorate in the nearby future.

The BOD and COD loading in the waterbody is an evidence of the anthropogenic activities in the catchment of the rivers, which is adversely influencing the water quality.

Biological parameters in all locations contain higher bacterial count is due to the discharge of sewage, drainage waste in to the water sources. The habit of open defecation is a common site on the bank of rivers that consequently floods into the river causing deterioration of the quality of the water. Even increase in human activities discharge bacteria of various type in to the water, which increase the number of count in the water.

## 1.7 Recommendations/Remedial Measures:

- Domestic effluents may be treated and disinfected before discharging.
- Effluents from the non-point sources may be identified. These are required to be collected and treated.
- Use of water of such polluted locations may be useful for tolerant crops and is recommended based on special study.
- Use of direct source water is to be avoided.
- Bathing at such location should be restricted.

## 1.8 Suggestions:

- Create mass awareness in general public regarding surface and ground water quality aspects.



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the importance of conservation and restoration of  
ort shall be publicly published every year.



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# CHAPTER – II

## INTRODUCTION

## CHAPTER-2

### INTRODUCTION

**1.0** Water is an essential for human life and the presence of reliable source of water is vital factor for the establishment of a community. Apart from its life supporting ability, water also has a potential for spreading ill health and diseases. Thus availability and importance of safe drinking water was realised and practiced thousands of years ago by man. Hence, water quality monitoring becomes a fundamental tool for river basin planning and management. The effective monitoring and management of water quality to safeguard the precious natural riverine system is a challenge for the scientific and engineering communities alike.

#### **2.0 Water Quality Network Layout**

The water quality monitoring of River Godavari and its tributaries and River Tapi and its tributaries flowing through Vidarbha is being carried out by Water Resources Division Nagpur under Hydrology Project since 2001.

In Godavari Basin Water Quality is monitored by Water Resources Division Nagpur at 17 stations and in Tapi Basin at 8 Stations on various rivers flowing through Vidarbha. Also the water quality of 4 reservoirs, which are used as a source of drinking water, is also being monitored by this Division. The stations are classified as baseline, trend and flux stations based on the frequency of sampling and location of stations. Details of Basin and Sub basins in the region are given in **Table 1**.

**Of 17 Water Quality stations on tributaries of Godavari, 12 are base line stations and 5 are trend stations.**

**Where as in Tapi Basin 1 is baseline station and 6 are trend stations.**

**Fig 1** shows Network of Water Quality Monitoring stations of various types in the jurisdiction of Water quality lab level-II under Hydrology Project Division, Nagpur.

#### **3.0 Network Design of river basin**

The network design comprises of monitoring stations which are classified as Baseline, Trend, & Flux Stations. Brief description of each type of stations is given below.

picture of Natural background Condition of a particular  
Baseline stations are positioned in unpolluted areas  
significant. Frequency of Sampling is generally one Sample in  
three months.

**Trend Station:** Trend stations are located on Main River and tributaries where the flow increases by 20%. In case of confluence, Trend Stations are located both on Tributary and main stream of the river before and after confluence. Frequency of sampling is generally 12 times in a year if the area is less than 1 lakh Sq. Km or 24 times in a year if the area is more than 1 lakh Sq. Km.

**Flux Station:** The flux stations are located on immediately upstream of Major River when it is about to cross the state border. These are meant to monitor the total flux of pollutants carried away by the stream.

In the present network there are **13 Baseline and 11 Trend stations**. List is given in

**Table 2.**

**Table 1: Details of the Basin**

Sr. No.	Major Basin	Independent River	Tributary	Sub-Tributary
1.	Godavari	Godavari	Wainganga	Pench Kanhana
			Wardha	
			Penganga	Pus
			Indravati	Bandiya
			Pranhita	
2.	Tapi	Tapi	Purna	Mun Wan Chandrabhaga

**Table 2:**  
**Under Jurisdiction of Water Quality Lab level-II, Nagpur**

NO.	STATION	DISTRICT	TAHASIL	NAME OF RIVER
<b>Baseline Stations</b>				
1	Deori	Gondia	Gondia	Wainganga
2.	KamthiKhairi	Nagpur	Parshioni	Pench
3.	Tembhurdoh	Nagpur	Saoner	Kanhan
4.	Wadsachinch	Chandrapur	Wadsa	Wainganga
5.	Wagholibuti	Gadchiroli	Gadchiroli	Wainganga
6.	Petta	Gadchiroli	Ettapalli	Bandia
7.	Damrencha	Gadchiroli	Aheri	Indravati
8.	Mathani	Nagpur	Mouda	Kanhan
9	Kardha	Bhandara	Bhandara	Wainganga
10	Drugwada	Wardha	Ashti	Wardha
11	Saiphall	Yeotmal	Ghatanji	Penganga
12	Khariya	Amravati	Dharni	Tapi
13	Mahagaon	Gadchiroli	Ettapalli	Pranhita
<b>Trend Stations</b>				
14.	Vishroli	Amravati	Chandurbazar	Purna
15.	Dhaba	Chandrapur	Gondpipri	Wardha
16.	WarudBagaji	Amravati	Tiwasa	Wardha
17.	Anantwadi	Yeotmal	Mahagaon	Pus
18.	Kolgaon	Yeotmal	Wuni	Penganga
19.	Soitdindora	Chandrapur	Warora	Wardha
20.	Warkhed	Akola	Telhara	Wan
21.	Daryapur	Amravati	Daryapur	Chandrabhaga
22	Manasgaon	Buldhana	Shegaon	Purna
23.	Kawatha	Akola	Balapur	Mun
24.	TakliKhetri	Akola	Patur	Mun
<b>Reservoirs</b>				
25.	Katepurna	Akola	Barshitakli	Katepurna
26.	Upper Wardha	Amravati	Morshi	Wardha
27.	Pench	Nagpur	Parshioni	Pench
28	Chapdoh	Yeotmal	Arni	Waghadi



## Announcement of Water Quality Lab Level-II, Nagpur in Analytical Quality Control Exercises

### **1) Within Lab AQC:**

Within Lab AQC conducted in December – 2010.

Samples (Sample A and Sample B) are analysed during the period 02-12-2010 to 24-12-2010.

The overall performance of the Lab stands **100%.**

### **2) Inter Lab AQC:**

26<sup>th</sup> Proficiency Testing (AQC / Water Exercise) conducted by CPCB in February-2011.

Samples received on dated 21-02-2011. Samples analysed during the period 21-02-2011 to 25-02-2011. And the Performance Report received in June-2011.

The overall performance of the Lab stands **72.7 %.**

### **3) Intra Lab AQC:**

Inter Lab AQC 2011 conducted by Water quality Lab Level-II, Pune, during the period February-2011 to April-2011.

We participated in All three Rounds. And the Average percentage of All three rounds stands **92%.**

## Annual Report for the Period of 2010-2011

### Water Quality Laboratory Level II at Nagpur

#### **Salient Features :-**

##### **1. General Structure of Laboratory:**

1) Sampling Locations as per Water Quality Network covered in this Lab:-28

2) Monthly sample collection: - 32 samples / 19 Samples.

3) Frequency of sampling: - **Trend: .** Monthly

**Baseline Samples :** Once in Three Months

**Dam samples:.** Fortnightly

4) Govt. staff related to Laboratory: -

1. Mr.P.P.Mendhe., Executive Engineer
2. Mr.C.D.Garibdas, Sub Divisional Engineer
3. Mr. M.M.Dange (AE-II. & Govt. Analyst)
4. Mr. N.L. Kature (C.E.A)

5) Lab operating Agency: - Ashwamedh Engineers & Consultants C.S.L.

a) Indoor Work . 1.Mr. Tanveer A. Ansari. (Chief Analyst)

2. Mr. Pranali R.Deshmukh. (Senior Analyst)

3. Miss. Neelima S.Ingle. (Microbiologist)

4.Miss. Rubina R. Khan (Analyst)

5. Mr. Sanjay Dhobale (Lab. Assistant)

b) Outdoor Work . 1. Mr. V. H. Hande (Field Chemist)

2. Mr. J.S.Tale (Field Chemist)

## **2. Scope of Work: Operation and Maintenance of water Quality Laboratory Level-II, Nagpur**

**Outdoor Work** - Surface water sampling and transporting the sample from selected Water Quality network sampling points as per schedule of sampling during the said period.

### **The Surface Water sampling includes:**

- a) Field determination as per standard guideline.
- b) Field parameters to be tested on site & entry to be taken on ID form.
- c) Sample to be transported to laboratory within prescribed time limit.

### **2.1 Indoor Work:**

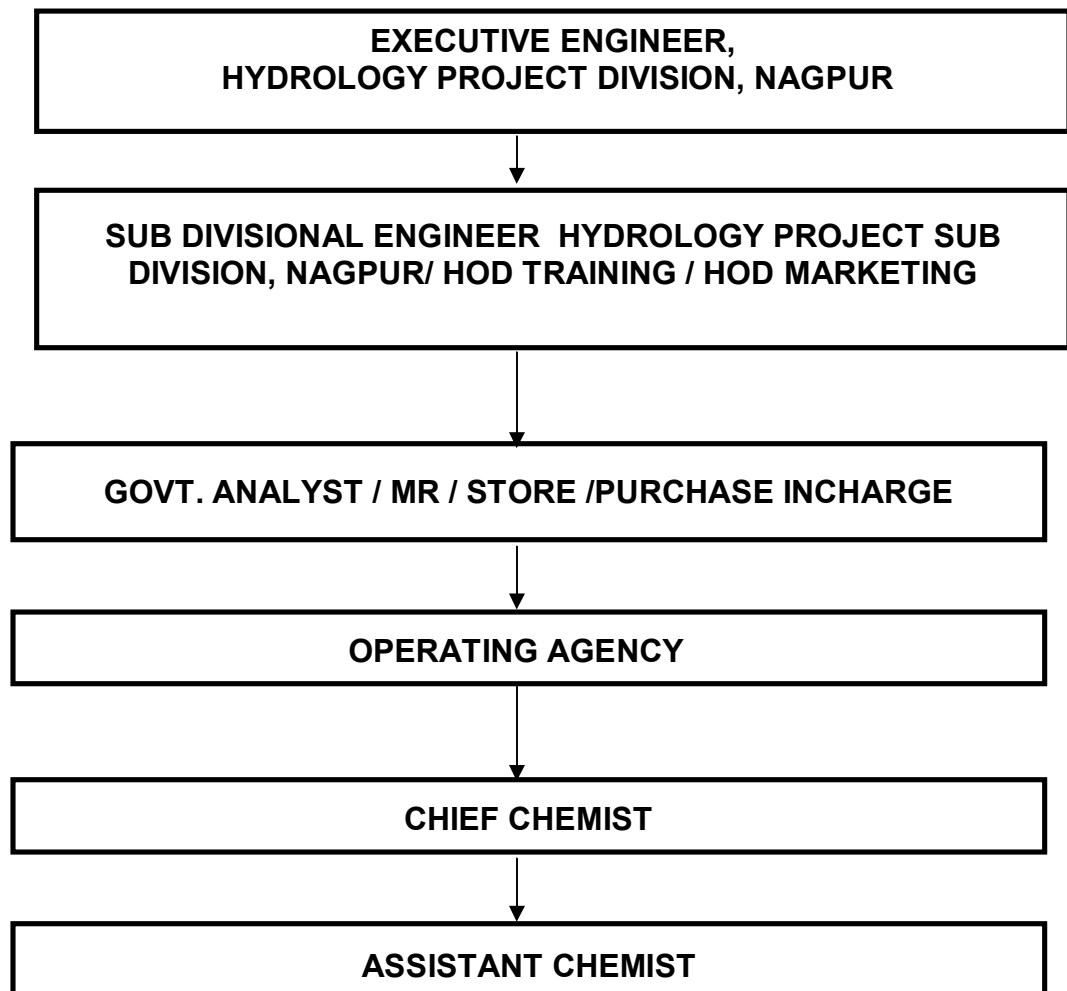
- Day to Day Operation and Maintenance of Water Quality Laboratory Level II.
- The work includes analysis of water samples as per the test procedures.
- Operating the instruments as per specified instruction manual.
- Entry of data in SWDES Software.
- Participating in Analytical Quality Control Exercise (AQC) round.
- i) Within Laboratory AQC ii) Intra Laboratory AQC iii) AQC by CPCB
- The Laboratory staff employed;
  - 1) Chief Chemist: 1 No.
  - 2) Sr. Research Officers: 2 Nos.
  - 3) Research Assistant: 1 No.
  - 4) Lab. Assistant: 1 No.
- The Indoor work also includes keeping data record.
- Log book of Lab equipment
- Preparation of monthly sampling Schedule.
- Keeping sampling record, instruments operation, Laboratory Management, demonstration
- Training to Departmental staff as and when required.

Information to visitors & Customer Satisfaction. Work is carried out as per flow chart.

## PROJECT DIVISION, NAGPUR

### WATER QUALITY LAB, LEVEL – II NAGPUR

#### ORGANISATION CHART



Location covered under the jurisdiction of  
Quality Lab Level-II, Nagpur

Sr. No.	Name of Station	Name of River	Frequency of sampling	No. Of Samples in 2010-2011
Baseline Samples				
1	Deori	Wainganga	Once in three months	3
2.	KamthiKhairi	Pench	Once in three months	4
3.	Tembhurdoh	Kanhan	Once in three months	4
4.	Wadsachinch	Wainganga	Once in three months	4
5.	Wagholibuti	Wainganga	Once in three months	4
6.	Petta	Bandia	Once in three months	4
7.	Damrencha	Indravati	Once in three months	4
8.	Mathani	Kanhan	Once in three months	4
9	Kardha	Wainganga	Once in three months	3
10	Drugwada	Wardha	Once in three months	4
11	Saiphall	Penganga	Once in three months	3
12	Khariya	Tapi	Once in three months	4
13	Mahagaon	Pranhita	Once in three months	4

		of River	Frequency of sampling	No. Of Samples in 2010-2011
<b>Trend Samples</b>				
14.	Vishroli	Purna	Monthly	8
15.	Dhaba	Wardha	Monthly	12
16.	WarudBagaji	Wardha	Monthly	11
17.	Anantwadi	Pus	Monthly	11
18.	Kolgaon	Penganga	Monthly	11
19.	Soitdindora	Wardha	Monthly	12
20.	Warkhed	Wan	Monthly	0
21.	Daryapur	Chandrabhaga	Monthly	3
22.	Manasgaon	Purna	Monthly	9
23.	Kawatha	Mun	Monthly	5
24.	TakliKhetri	Mun	Monthly	7
<b>Reservoir Samples</b>				
25.	Katepurna	Katepurna	twice in a Month	24
26.	Upper Wardha	Wardha	twice in a Month	24
27.	Pench	Pench	twice in a Month	24
28	Chapdoh	Waghadi	twice in a Month	24

**Total No. of Samples collected and analyzed during Reported Period**  
**(June-2010 to May-2011) – 234 Nos.**

## Following Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Trend Samples

Sr. No.	First Round (Once in a year)	Second Round (Rest of the year)
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Turbidity
8	Total Dissolved Solids	Total Solids
9	Total Solids	Total Dissolved Solids
10	Suspended Solids	Suspended Solids
11	NH <sub>3</sub> -N	NH <sub>3</sub> -N
12	NO <sub>2</sub>	NO <sub>2</sub>
13	NO <sub>3</sub>	NO <sub>3</sub>
14	Total Phosphorus	Total Phosphorus
15	Biochemical Oxygen Demand (BOD)	Biochemical Oxygen Demand (BOD)
16	Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD)
17	Alkalinity	Alkalinity
18	Potassium	Potassium
19	Sodium	Sodium
20	Total Hardness	Total Hardness
21	Calcium	Calcium
22	Magnesium	Magnesium
23	Chlorides	Chlorides
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	Total coliforms
27	Fecal coliforms	Feacal Colliforms
28	Fluoride	
29	Boron	





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## Showing Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Baseline Samples

Sr. No.	First Round ( Once in a year )	Second Round ( Rest of the year )
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Total Solids
8	Total Dissolved Solids	Total Dissolved Solids
9	Total Solids	Suspended Solids
10	Suspended Solids	NO <sub>2</sub>
11	NH <sub>3</sub> -N	NO <sub>3</sub>
12	NO <sub>2</sub>	Total Phosphorus
13	NO <sub>3</sub>	Biochemical Oxygen Demand (BOD)
14	Total Phosphorus	Chemical Oxygen Demand (COD)
15	Biochemical Oxygen Demand (BOD)	Alkalinity
16	Chemical Oxygen Demand (COD)	Potassium
17	Alkalinity	Sodium
18	Potassium	Total Hardness
19	Sodium	Calcium
20	Total Hardness	Magnesium
21	Calcium	Chlorides
22	Magnesium	Total coliforms
23	Chlorides	Faecal Colliforms
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	
27	Fecal coliforms	
28	Fluoride	
29	Boron	

## Showing Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Dam Samples

Sr. No.	First Round ( Once in a year )	Second Round ( Rest of the year )
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Total Solids
8	Total Dissolved Solids	Total Dissolved Solids
9	Total Solids	Suspended Solids
10	Suspended Solids	NO <sub>2</sub>
11	NH <sub>3</sub> -N	NO <sub>3</sub>
12	NO <sub>2</sub>	Total Phosphorus
13	NO <sub>3</sub>	Biochemical Oxygen Demand (BOD)
14	Total Phosphorus	Chemical Oxygen Demand (COD)
15	Biochemical Oxygen Demand (BOD)	Alkalinity
16	Chemical Oxygen Demand (COD)	Potassium
17	Alkalinity	Sodium
18	Potassium	Total Hardness
19	Sodium	Calcium
20	Total Hardness	Magnesium
21	Calcium	Chlorides
22	Magnesium	Total coliforms
23	Chlorides	Faecal Colliforms
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	Total Kjeldahl nitrogen
27	Fecal coliforms	Chlorophyll – A
28	Fluoride	
29	Boron	
30	Total Kjeldahl nitrogen	
31	Chlorophyll – A	



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## CHAPTER – III METHODOLOGY

This laboratory covers Surface Water component which covers Godavari & Tapi Basins and some selected reservoirs.

#### 3.1 Rivers

Water is life and rivers are lifelines. Fortunately almost the entire country is criss-crossed by rivers. Geographical area of the state is divided in five river basins viz. Godavari, Tapi, Narmada, Krishna and west flowing rivers in Konkan region.

#### 3.2 Water Quality Monitoring - Objectives

Observations of analysis of physical & chemical parameters as per Uniform Protocol for Water Quality Monitoring Order 2005+ for each location followed by Operation and Maintenance of Water Quality Laboratory Level-II, Nagpur as per Standard Guidelines and mandates including collection, transportation and analysis of samples, data entry in SWDES Software and preparation of the said Annual Report as per specific guidelines issued by Superintending Engineer, Hydrology Project Circle( Collection), Nashik.

#### 3.3 Methodology:

Analysis of Physical and Chemical parameters is done in the laboratory on the basis of Standard Analytical Methods, Instrument Operating Instructions, HIS Manuals, and APHA, 21st Ed., 2005.

Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and is entered in SWDES Software for Water Quality Data Entry. Further the data is sent to State Data Center for further dissemination to user end.

Furthermore to get an idea of about data generated for the period it is decided and instructed to analyzed the generated data for the said period in the form of Annual report with the help of various tools in SWDES Software to find out critical parameters and critical locations in the jurisdiction of this Lab.

#### 3.4 Flow Chart

The work of analysis of sample is being monitored on the basis of flow chart generated in the lab as per standard guidelines and analysis of sample is performed as per guidelines of world bank with HIS manuals and APHA, 21 st Ed, 2005 as a standard procedures for analysis of samples.



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## ANALYSIS OF HP (REGULAR) WATER SAMPLES



Sampling Source with the help of Depth Sampler

**Treatment:** D.O. Fixing, Preservation of MPN Sample, Colour, Odour Temp, pH, Ec, tested on field, and fill up ID form.

**At Laboratory:** Inward the Sample, Giving the Sr. No. to the sample noted into sample entry register

ID form entry taken into SWEDS Software

Tests are carried out in lab as per Standard Procedures. These tests are : Microbiological test, Chlorophyll-a, Temp, pH, D.O., B.O.D, Ammonia, Nitrate, Nitrite TDS, TSS, C.O.D., Turbidity, Alkalinity, Carbonate & Bicarbonate, Chloride, Fluoride, Boron, Iron, Sodium, Potassium, Total Hardness, Phosphorous, Calcium etc.

Observations & calculations of all Analyzed Parameters are entered in the Data Sheet

The results of parameters are checked & validated

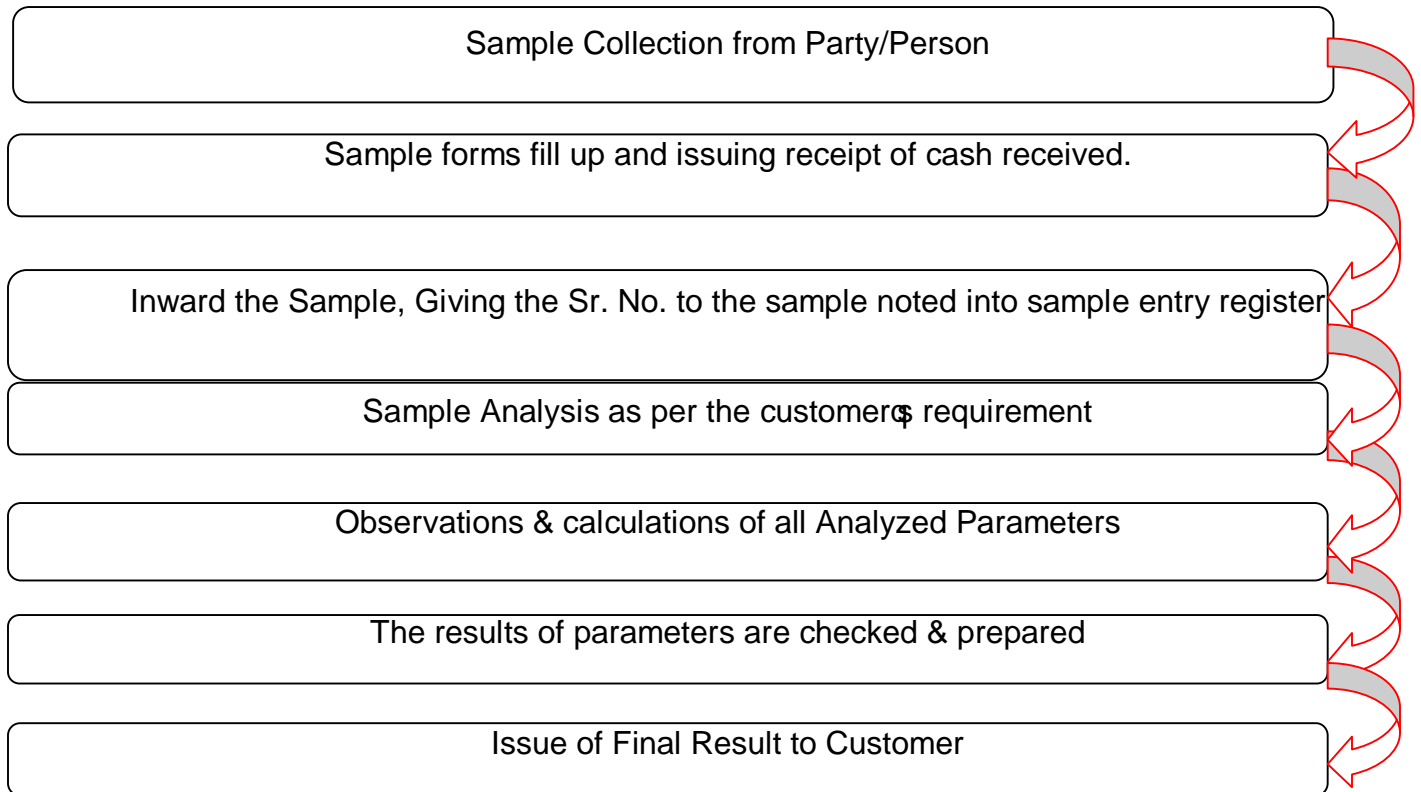
After Validation Check, all the data is entered in to Data Record and Validation Register

This data is finally entered in to SWEDS Software

Data sent to Executive Engineer, HDP Division, Nashik for further action



## OF ANALYSIS OF PRIVATE (regular) WATER SAMPLE



of Water Quality samples the following parameters  
zed during the Period 2010-2011

ers and the methodology used for the analysis.

Sr. No.	Parameters	Methodology
1	Determination of Alkalinity Phenolphthalein	Standard. Methods, APHA 21 <sup>st</sup> Edition.
2	Determination of Alkalinity Total	Standard. Methods, APHA 21 <sup>st</sup> Edition.
3	Determination of Aluminium	Standard. Methods, APHA 21 <sup>st</sup> Edition
4	Determination of Bicarbonates	Standard. Methods, APHA 21 <sup>st</sup> Edition
5	Determination of Biochemical Oxygen Demand	Standard. Methods, APHA 21 <sup>st</sup> Edition
6	Determination of Boron	Standard. Methods, APHA 21 <sup>st</sup> Edition
7	Determination of Calcium	Standard. Methods, APHA 21 <sup>st</sup> Edition
8	Determination of Carbonates	Standard. Methods, APHA 21 <sup>st</sup> Edition
9	Determination of Chemical Oxygen Demand	Standard. Methods, APHA 21 <sup>st</sup> Edition
10	Determination of Chlorides	Standard. Methods, APHA 21 <sup>st</sup> Edition
11	Determination of Chlorophyll . A	Standard. Methods, APHA 21 <sup>st</sup> Edition
12	Determination of Faecal Coliforms (MPN)	Standard. Methods, APHA 21 <sup>st</sup> Edition
13	Determination of Total Coliforms ( MPN )	Standard. Methods, APHA 21 <sup>st</sup> Edition
14	Determination of Colour	Standard. Methods, APHA 21 <sup>st</sup> Edition
15	Determination of Dissolved Oxygen	Standard. Methods, APHA 21 <sup>st</sup> Edition
16	Determination of Conductivity	Standard. Methods, APHA 21 <sup>st</sup> Edition
17	Determination of Fluorides	Standard. Methods, APHA 21 <sup>st</sup> Edition
18	Determination of Hardness	Standard. Methods, APHA 21 <sup>st</sup> Edition
19	Determination of Iron	Standard. Methods, APHA 21 <sup>st</sup> Edition
20	Determination of Magnesium	Standard. Methods, APHA 21 <sup>st</sup> Edition
21	Determination of Manganese	Standard. Methods, APHA 21 <sup>st</sup> Edition
22	Determination of Ammonia Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
23	Determination of Nitrates	Standard. Methods, APHA 21 <sup>st</sup> Edition
24	Determination of Nitrite	Standard. Methods, APHA 21 <sup>st</sup> Edition



	Parameters	Methodology
25	Determination of Organic Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
26	Determination of Total Oxidised Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
27	Determination of Odour	Standard. Methods, APHA 21 <sup>st</sup> Edition
28	Determination of pH	Standard. Methods, APHA 21 <sup>st</sup> Edition
29	Determination of Ortho Phosphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
30	Determination of Total Phosphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
31	Determination of Potassium	Standard. Methods, APHA 21 <sup>st</sup> Edition
32	Determination of Silica	Standard. Methods, APHA 21 <sup>st</sup> Edition
33	Determination of Sodium	Standard. Methods, APHA 21 <sup>st</sup> Edition
34	Determination of Suspended Solids- TSS	Standard. Methods, APHA 21 <sup>st</sup> Edition
35	Determination of Total Solids- TS	Standard. Methods, APHA 21 <sup>st</sup> Edition
36	Determination of Dissolved Solids- TDS	Standard. Methods, APHA 21 <sup>st</sup> Edition
37	Determination of Sulphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
38	Determination of Temperature	Standard. Methods, APHA 21 <sup>st</sup> Edition
39	Determination of Turbidity	Standard. Methods, APHA 21 <sup>st</sup> Edition
42	Determination of Free Carbon dioxide	Standard. Methods, APHA 21 <sup>st</sup> Edition
41	Determination of Phenols	Standard. Methods, APHA 21 <sup>st</sup> Edition
42	Determination of Chlorine , Residual	Standard. Methods, APHA 21 <sup>st</sup> Edition
43	Determination of Permanganate Value/ Oxygen Absorbed/ Tidy's Test	Standard. Methods, APHA 21 <sup>st</sup> Edition
44	Determination of Oil & Grease	Standard. Methods, APHA 21 <sup>st</sup> Edition
45	Determination of Acidity	Standard. Methods, APHA 21 <sup>st</sup> Edition
46	Analysis Results (Expression)	Standard. Methods, APHA 21 <sup>st</sup> Edition
47	Data Record and Validation	Standard. Methods, APHA 21 <sup>st</sup> Edition
48	Waste Disposal	HP Approved



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# CHAPTER – IV

## RESULT & OBSERVATIONS

#### 4.1 RESULTS AND OBSERVATIONS

The water quality monitoring in the area of surface water is performed in order to determine the quality of water. Various parameters are analyzed in the laboratory and 6 parameters are tested at field level. All these tasks recorded are utilized for preparing the Annual Report by performing some specific exercise. This data is considered in order to specify the quality of water at each location. This also helps to determine the pollution level or concentration in each source of water at each station.

#### 4.2 Water Quality status- Station wise Exercise

In order to study water quality status station wise, all locations covered under this lab during the year 2010-2011 are considered. Seasonal averages of all analyzed parameters are calculated for study of seasonal water quality trend at each location.

#### 4.3 Objectives

Observations of all physical & chemical parameters are analysed for each location individually & interpretation of data is done to identify seasonal trend. Also critical parameters are identified at every location, including finding out the probable causes behind it at every location and every parameter.

## Summary & Graphs (2010-2011)

DATA ABSTRACT FOR RIVER WAINGANGA FOR 2010-2011					
Station: Deori					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.3
2	EC	µmhos/cm	356.0	346.0	320.0
3	DO	mg/L	6.4	7.3	6.8
4	BOD	mg/L	3.0	2.8	3.4
5	COD	mg/L	13.0	9.0	14.0
6	TDS	mg/L	220.0	212.0	198.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	200.0	212.0	192.0
8	Chloride	mg/L	16.0	22.0	13.0
9	Calcium (as Ca)	mg/L	36.8	32.0	29.6
10	Magnesium (as Mg)	mg/L	15.6	18.5	16.5
11	Total coliforms	MPN/100 ml	78.0	14.0	0.0
12	Faecal coliforms	MPN/100 ml	45.0	5.0	0.0
Station: Kardha					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.0	8.3	8.4
2	EC	µmhos/cm	214.0	335.0	281.0
3	DO	mg/L	7.0	6.9	7.0
4	BOD	mg/L	2.8	2.9	3.0
5	COD	mg/L	10.0	10.0	11.0
6	TDS	mg/L	128.0	208.0	166.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	120.0	184.0	160.0
8	Chloride	mg/L	8.0	21.0	14.0
9	Calcium (as Ca)	mg/L	25.6	35.2	29.6
10	Magnesium (as Mg)	mg/L	6.8	10.7	15.1
11	Total coliforms	MPN/100 ml	490.0	26.0	7.0
12	Faecal coliforms	MPN/100 ml	230.0	8.0	0.0



Station: WadsaChinch					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.2	8.3
2	EC	µmhos/cm	309.0	391.0	346.0
3	DO	mg/L	6.5	6.8	5.2
4	BOD	mg/L	3.0	3.2	4.0
5	COD	mg/L	11.0	13.0	14.0
6	TDS	mg/L	182.0	242.0	212.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	154.0	216.0	192.0
8	Chloride	mg/L	22.0	26.0	21.0
9	Calcium (as Ca)	mg/L	22.4	40.0	30.4
10	Magnesium (as Mg)	mg/L	10.2	13.6	16.5
11	Total coliforms	MPN/100 ml	384.0	70.0	21.0
12	Faecal coliforms	MPN/100 ml	150.0	23.0	9.0
Station: WagholiButti					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	274.5	352.0	319.0
3	DO	mg/L	6.9	7.0	7.0
4	BOD	mg/L	3.0	3.0	3.0
5	COD	mg/L	11.5	11.0	11.0
6	TDS	mg/L	161.0	208.0	196.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	128.0	192.0	184.0
8	Chloride	mg/L	21.0	22.0	20.0
9	Calcium (as Ca)	mg/L	17.6	35.2	25.6
10	Magnesium (as Mg)	mg/L	11.7	14.6	13.6
11	Total coliforms	MPN/100 ml	204.0	130.0	34.0
12	Faecal coliforms	MPN/100 ml	107.5	22.0	11.0
DATA ABSTRACT FOR RIVER KANHAN FOR 2010-2011					
Station: Temburdoh					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.1	8.4	8.4
2	EC	µmhos/cm	408.5	390.0	541.0
3	DO	mg/L	6.0	6.6	7.2
4	BOD	mg/L	3.0	3.0	2.9
5	COD	mg/L	11.5	12.0	10.0
6	TDS	mg/L	235.0	232.0	314.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	226.0	204.0	328.0
8	Chloride	mg/L	10.5	28.0	14.0





mg/L	42.4	40.0	44.8
mg/L	14.6	17.5	32.1
MPN/100 ml	310.0	22.0	11.0
MPN/100 ml	102.0	7.0	5.0

**Station: Mathani**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.4	8.4
2	EC	µmhos/cm	396.0	280.0	490.0
3	DO	mg/L	6.7	6.6	7.2
4	BOD	mg/L	3.3	2.6	3.0
5	COD	mg/L	13.0	9.0	12.0
6	TDS	mg/L	232.0	172.0	292.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	162.0	160.0	244.0
8	Chloride	mg/L	43.0	15.0	40.0
9	Calcium (as Ca)	mg/L	28.0	33.6	32.0
10	Magnesium (as Mg)	mg/L	14.6	14.6	24.8
11	Total coliforms	MPN/100 ml	660.0	33.0	12.0
12	Faecal coliforms	MPN/100 ml	300.0	11.0	5.0

**DATA ABSTRACT FOR RIVER PENCH FOR 2010-2011**

**Station: Kamptikhairi**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.1	8.4	8.3
2	EC	µmhos/cm	464.5	460.0	432.0
3	DO	mg/L	6.2	7.2	7.0
4	BOD	mg/L	2.7	2.8	3.0
5	COD	mg/L	10.5	10.0	11.0
6	TDS	mg/L	278.0	284.0	264.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	276.0	244.0	312.0
8	Chloride	mg/L	11.5	42.0	10.0
9	Calcium (as Ca)	mg/L	40.8	44.8	36.8
10	Magnesium (as Mg)	mg/L	18.5	17.5	26.2
11	Total coliforms	MPN/100 ml	285.0	49.0	22.0
12	Faecal coliforms	MPN/100 ml	96.0	13.0	8.0

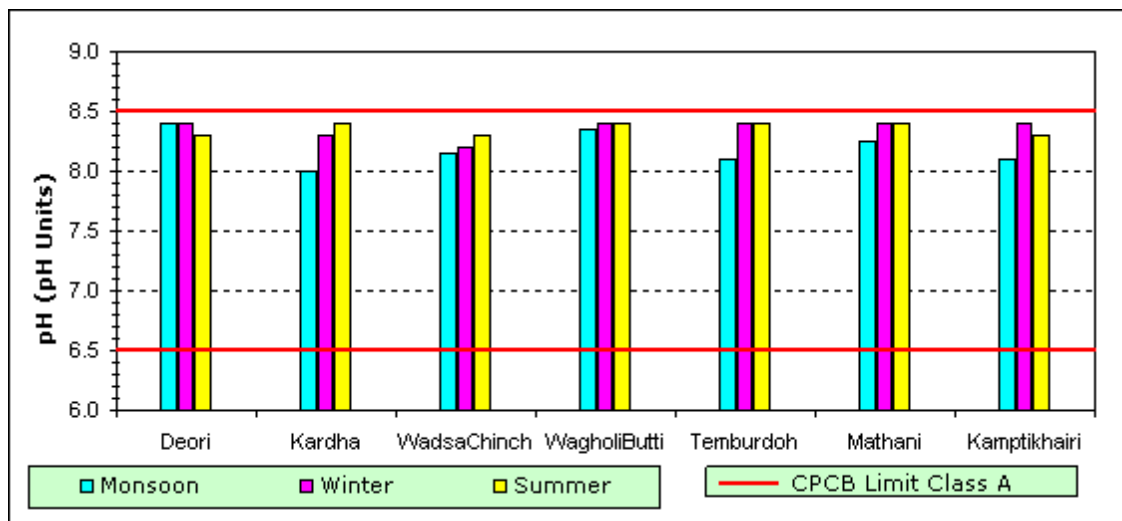


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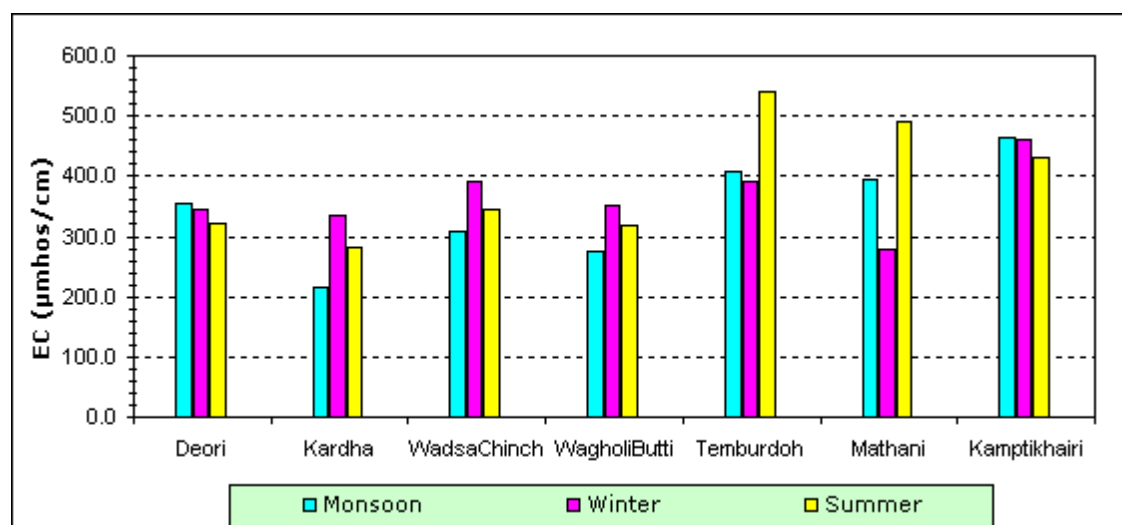
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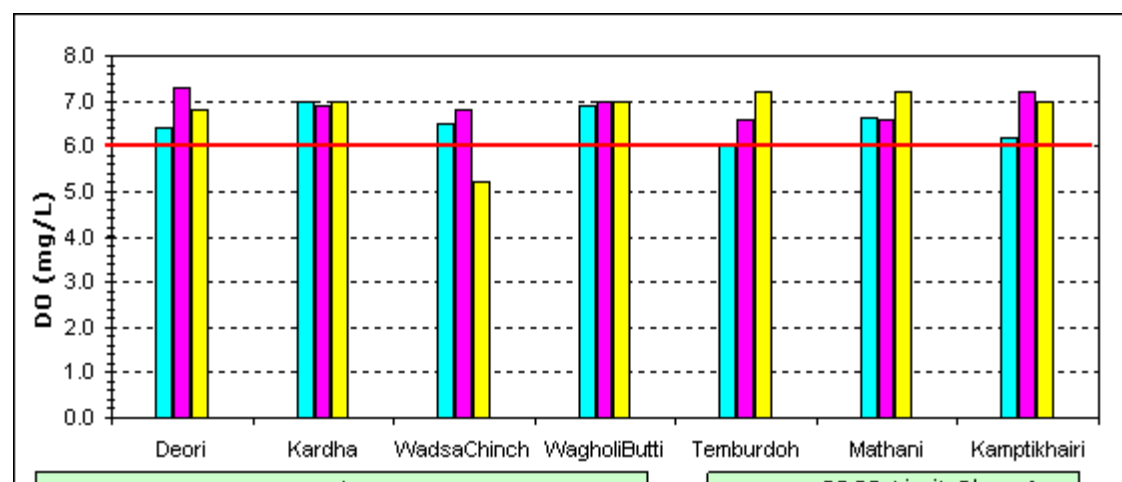
**Graph Showing Variation in pH for the year 2010-2011**



**Graph Showing Variation in EC for the year 2010-2011**



**Graph Showing Variation in Dissolved Oxygen for the year 2010-2011**



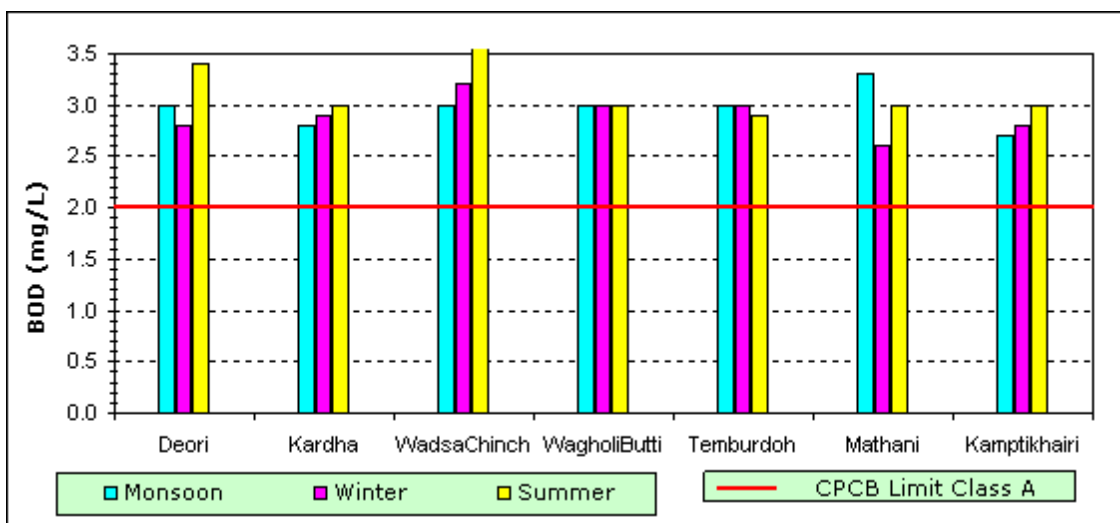


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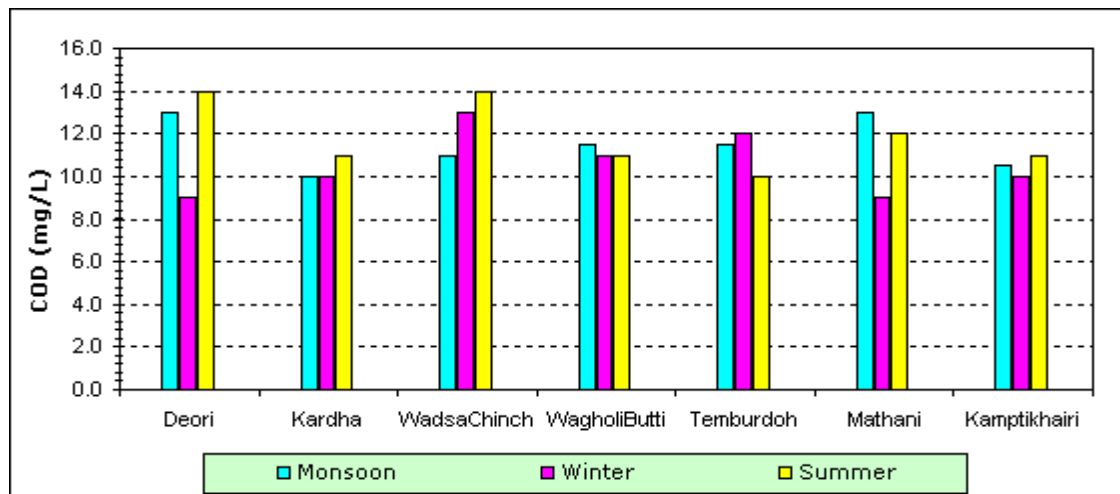
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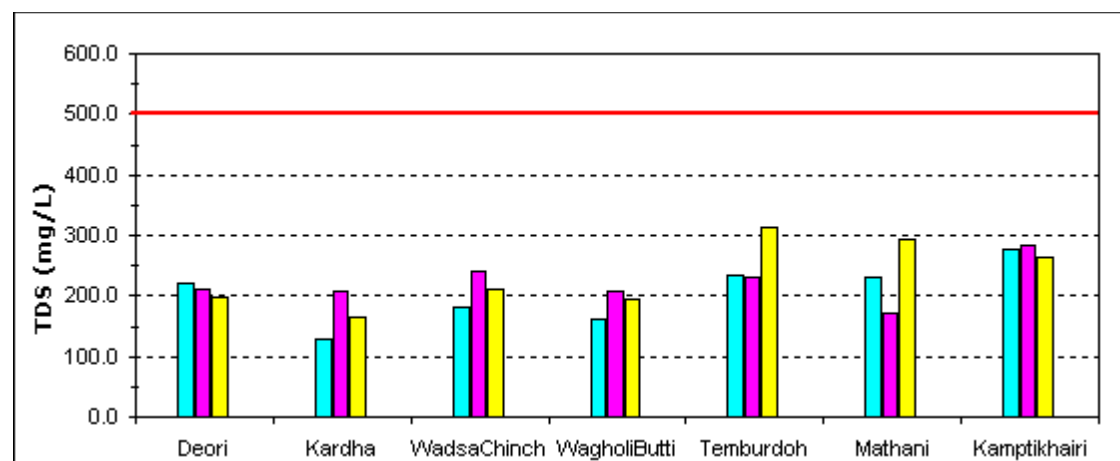
**Graph Showing Variation in BOD for the year 2010-2011**



**Graph Showing Variation in COD for the year 2010-2011**



**Graph Showing Variation in TDS for the year 2010-2011**



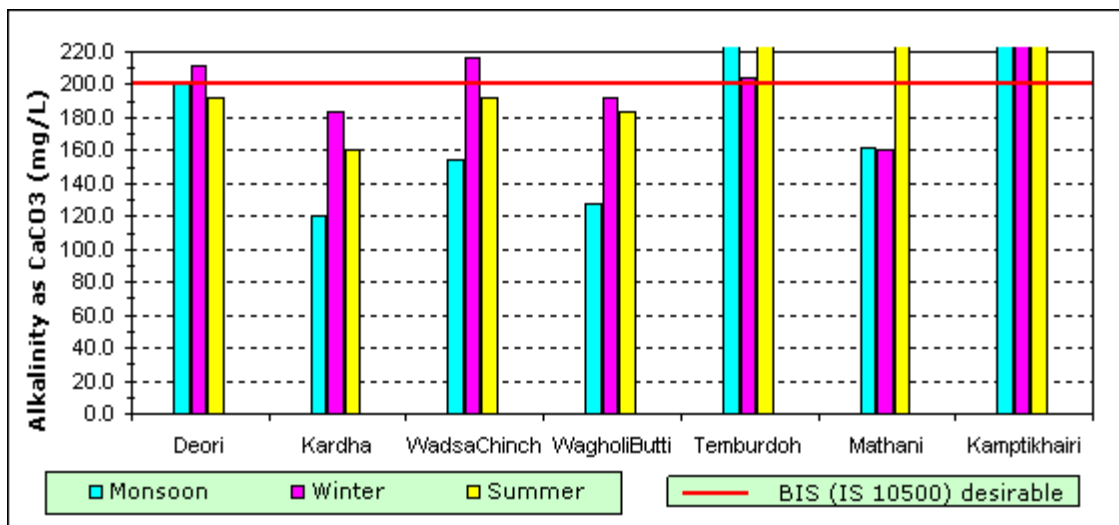


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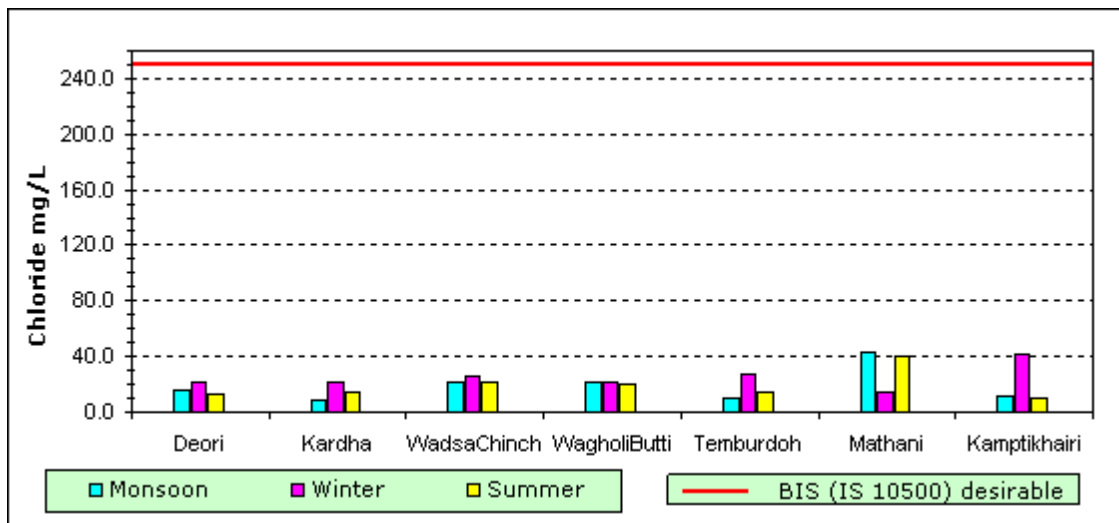
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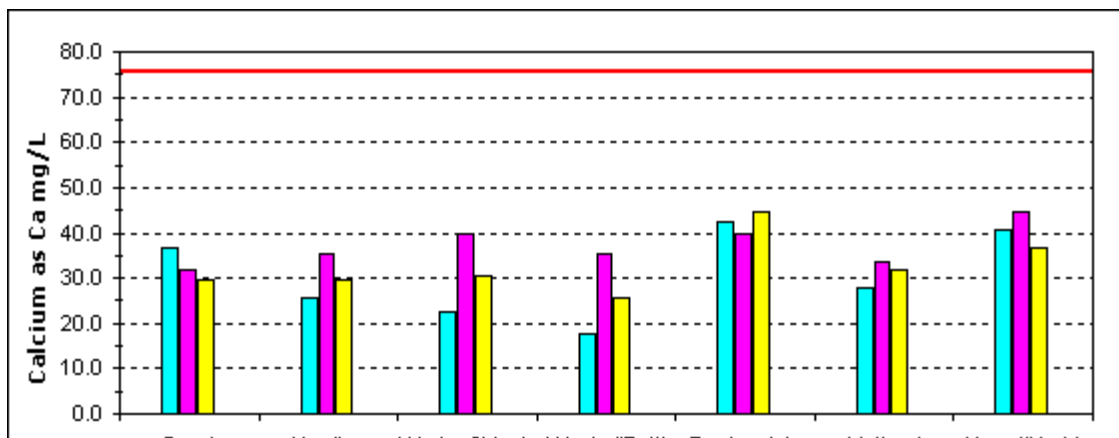
**Graph Showing Variation in Alkalinity for the year 2010-2011**



**Graph Showing Variation in Chloride for the year 2010-2011**



**Graph Showing Variation in Calcium as Ca for the year 2010-2011**



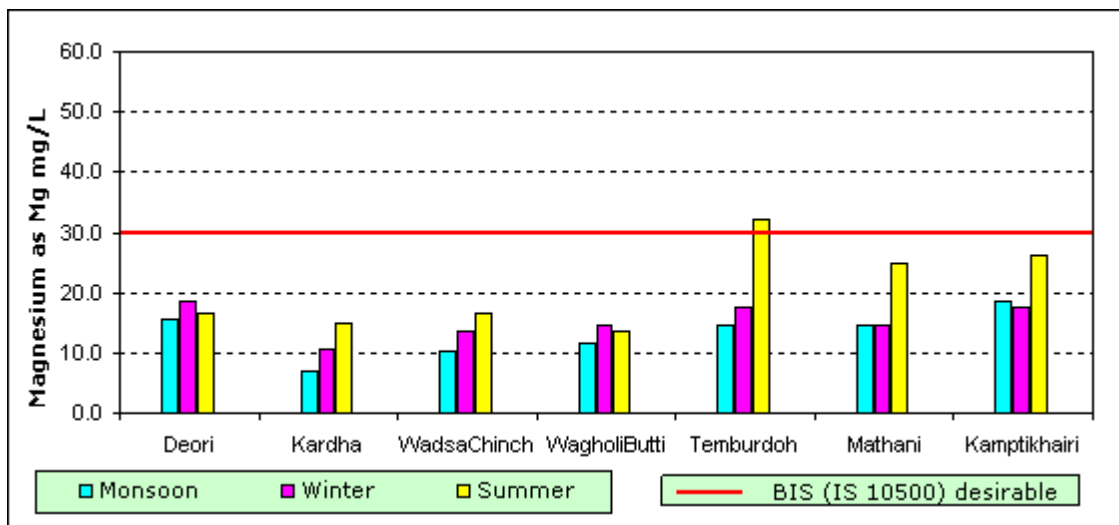


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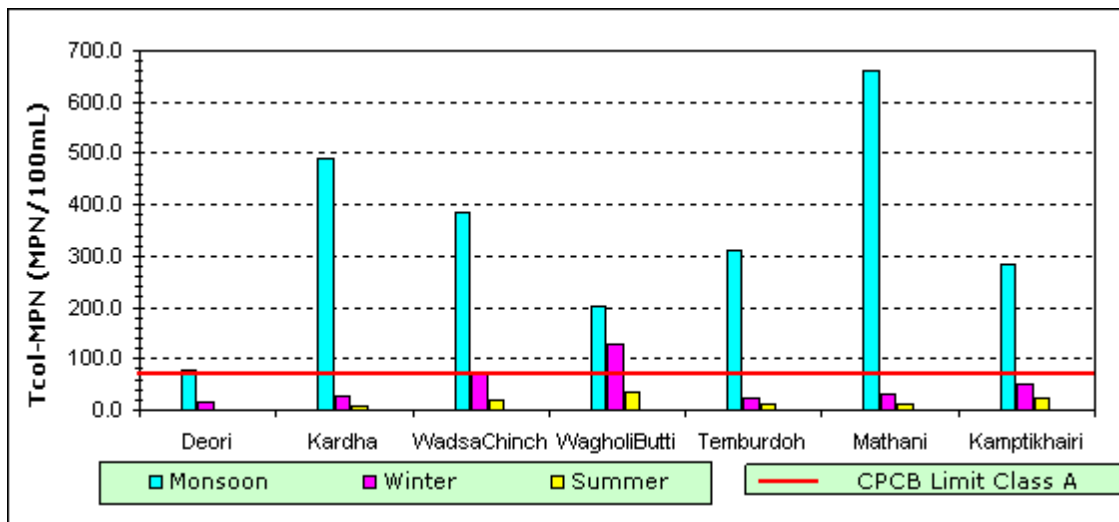
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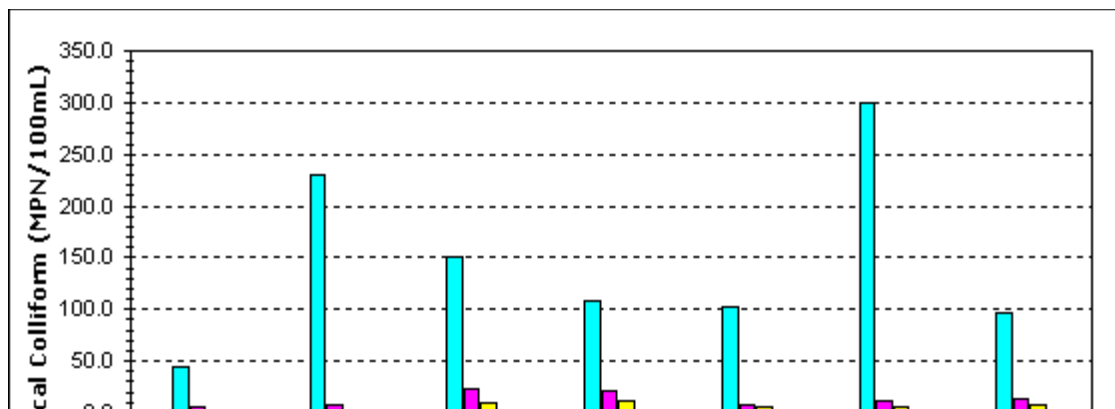
**Graph Showing Variation in Magnesium as Mg for the year 2010-2011**



**Graph Showing Variation in Total Colliforms for the year 2010-2011**



**Graph Showing Variation in Faecal Colliforms for the year 2010-2011**



DATA ABSTRACT FOR RIVER PURNA FOR 2010-2011					
Station: Manasgaon					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.3	8.4
2	EC	µmhos/cm	291.0	466.4	493.0
3	DO	mg/L	6.2	6.7	7.5
4	BOD	mg/L	3.3	3.2	2.8
5	COD	mg/L	14.3	13.0	9.0
6	TDS	mg/L	173.3	281.6	292.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	136.0	213.6	264.0
8	Chloride	mg/L	17.0	40.0	25.0
9	Calcium (as Ca)	mg/L	30.4	43.8	49.6
10	Magnesium (as Mg)	mg/L	10.7	18.5	19.4
11	Total colliforms	MPN/100 ml	1500.0	135.8	22.0
12	Faecal colliforms	MPN/100 ml	780.0	35.8	7.0
Station: Vishroli					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.4
2	EC	µmhos/cm	482.5	354.6	480.0
3	DO	mg/L	5.8	7.0	6.6
4	BOD	mg/L	3.7	2.7	3.4
5	COD	mg/L	15.0	9.6	11.0
6	TDS	mg/L	286.0	216.8	282.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	234.0	178.4	248.0
8	Chloride	mg/L	33.5	21.6	27.0
9	Calcium (as Ca)	mg/L	39.2	39.0	52.8
10	Magnesium (as Mg)	mg/L	12.6	12.2	14.6
11	Total colliforms	MPN/100 ml	260.0	99.6	9.0
12	Faecal colliforms	MPN/100 ml	92.5	39.4	4.0
DATA ABSTRACT FOR RIVER MUN FOR 2010-2011					
Station: Kawatha					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	
2	EC	µmhos/cm	325.0	365.8	
3	DO	mg/L	6.0	7.1	
4	BOD	mg/L	3.1	2.8	



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		mg/L	14.0	10.3	
		mg/L	190.0	220.0	
		g/L as CaCO3	160.0	183.0	
		mg/L	17.0	22.0	
		mg/L	30.4	38.4	
10	<b>Magnesium (as Mg)</b>	mg/L	12.6	14.8	
11	<b>Total coliforms</b>	MPN/100 ml	1700.0	70.0	
12	<b>Faecal coliforms</b>	MPN/100 ml	790.0	21.5	



Station: Taklikhetri					
		Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.4
2	EC	µmhos/cm	388.0	426.2	813.0
3	DO	mg/L	5.6	6.8	6.5
4	BOD	mg/L	3.8	2.9	4.4
5	COD	mg/L	14.0	10.2	16.0
6	TDS	mg/L	228.0	256.0	486.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	200.0	197.6	308.0
8	Chloride	mg/L	17.0	34.2	105.0
9	Calcium (as Ca)	mg/L	54.4	44.8	64.0
10	Magnesium (as Mg)	mg/L	18.5	16.7	19.4
11	Total coliforms	MPN/100 ml	460.0	111.0	70.0
12	Faecal coliforms	MPN/100 ml	170.0	39.3	21.0
DATA ABSTRACT FOR RIVER CHANDRABHAGA FOR 2010-2011					
Station: Daryapur					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.5	8.5	
2	EC	µmhos/cm	260.5	345.0	
3	DO	mg/L	6.1	6.0	
4	BOD	mg/L	3.4	3.4	
5	COD	mg/L	13.5	12.0	
6	TDS	mg/L	160.0	202.0	
7	Alkalinity	mg/L as CaCO <sub>3</sub>	138.0	176.0	
8	Chloride	mg/L	13.0	15.0	
9	Calcium (as Ca)	mg/L	26.4	33.6	
10	Magnesium (as Mg)	mg/L	7.3	9.7	
11	Total coliforms	MPN/100 ml	585.0	210.0	
12	Faecal coliforms	MPN/100 ml	180.0	68.0	
DATA ABSTRACT FOR RIVER TAPI FOR 2010-2011					
Station: Kharia					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.3	8.4
2	EC	µmhos/cm	489.5	359.0	369.0
3	DO	mg/L	5.4	6.2	6.4
4	BOD	mg/L	3.6	3.4	4.0
5	COD	mg/L	15.0	14.0	12.0
6	TDS	mg/L	286.0	218.0	228.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	198.0	184.0	192.0
8	Chloride	mg/L	45.5	21.0	20.0
9	Calcium (as Ca)	mg/L	49.6	36.8	41.6
10	Magnesium (as Mg)	mg/L	15.1	13.6	17.5
11	Total coliforms	MPN/100 ml	639.0	140.0	23.0
12	Faecal coliforms	MPN/100 ml	240.0	46.0	8.0





# FOR RIVER PENGANGA FOR 2010-2011

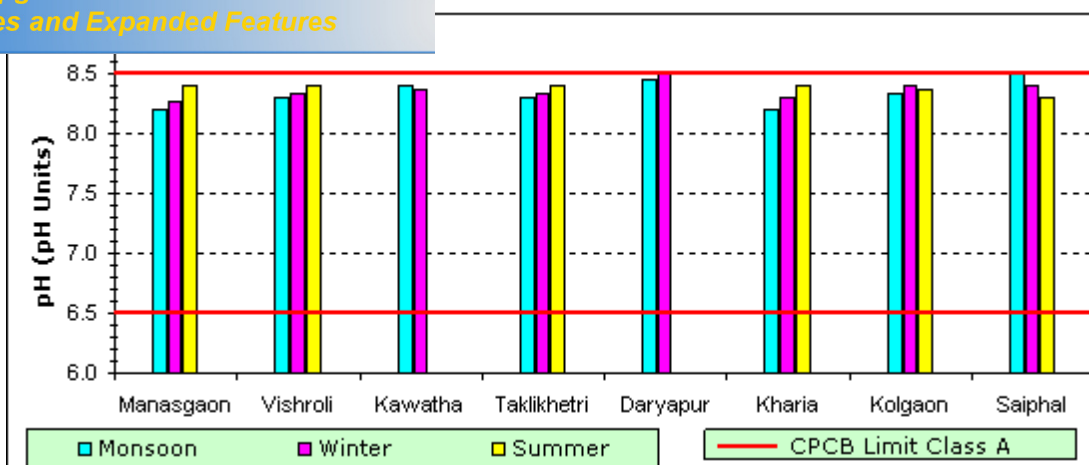
## Station: Kolgaon

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.4	8.4
2	EC	µmhos/cm	272.0	424.8	417.7
3	DO	mg/L	6.5	6.9	6.3
4	BOD	mg/L	3.2	3.0	3.5
5	COD	mg/L	12.3	10.8	13.0
6	TDS	mg/L	166.0	255.2	258.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	142.7	216.4	233.3
8	Chloride	mg/L	11.0	30.2	24.7
9	Calcium (as Ca)	mg/L	33.1	36.2	34.7
10	Magnesium (as Mg)	mg/L	11.3	25.5	17.3
11	Total coliforms	MPN/100 ml	733.3	81.0	31.0
12	Faecal coliforms	MPN/100 ml	276.7	23.8	8.0

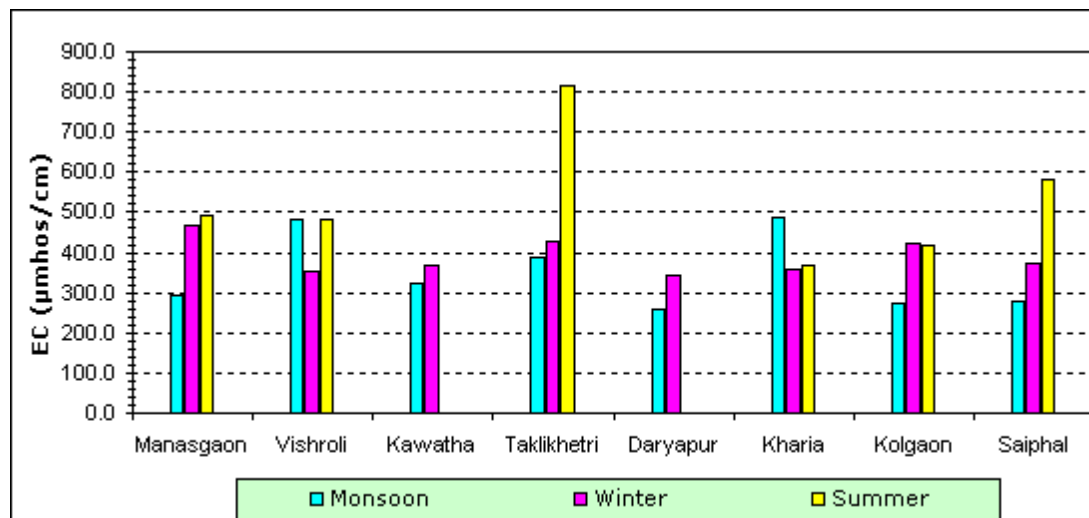
## Station: Saiphal

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.5	8.4	8.3
2	EC	µmhos/cm	279.0	371.0	584.0
3	DO	mg/L	6.6	7.0	6.8
4	BOD	mg/L	3.0	3.2	3.4
5	COD	mg/L	13.0	13.0	14.0
6	TDS	mg/L	166.0	220.0	352.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	140.0	168.0	256.0
8	Chloride	mg/L	12.0	26.0	40.0
9	Calcium (as Ca)	mg/L	32.0	41.6	72.0
10	Magnesium (as Mg)	mg/L	12.6	11.7	8.8
11	Total coliforms	MPN/100 ml	1100.0	70.0	49.0
12	Faecal coliforms	MPN/100 ml	490.0	22.0	14.0

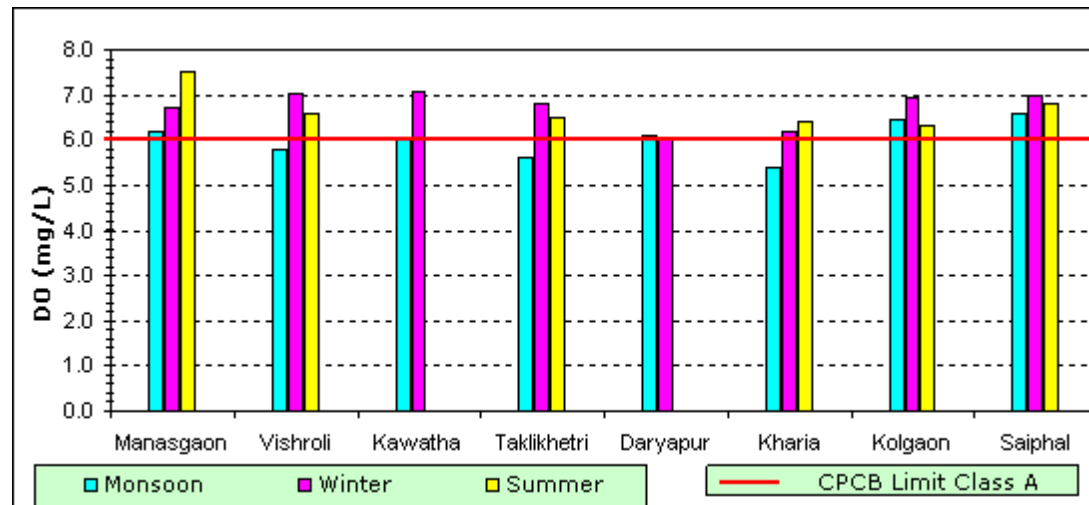
**Variation in pH for the year 2010-2011**



**Graph Showing Variation in EC for the year 2010-2011**



**Graph Showing Variation in Dissolved Oxygen for the year 2010-2011**



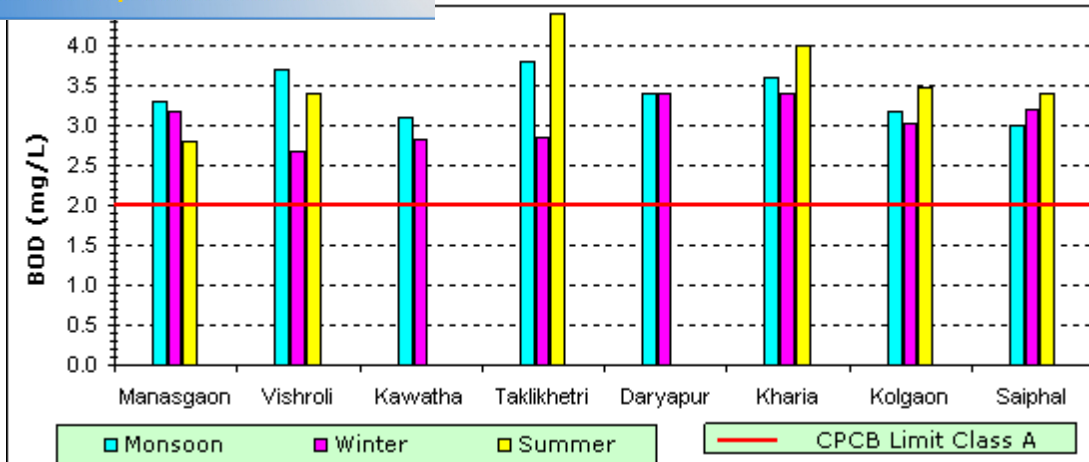


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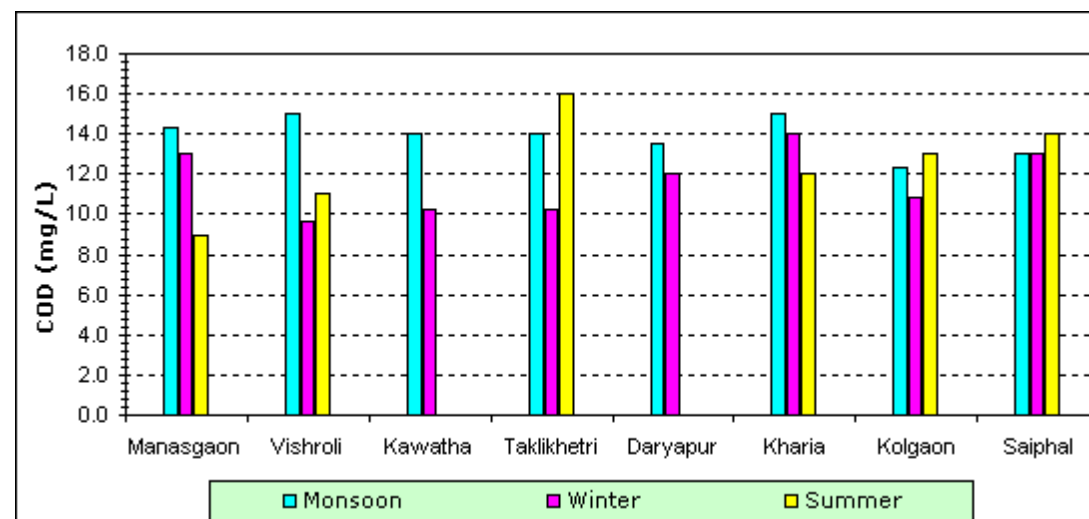
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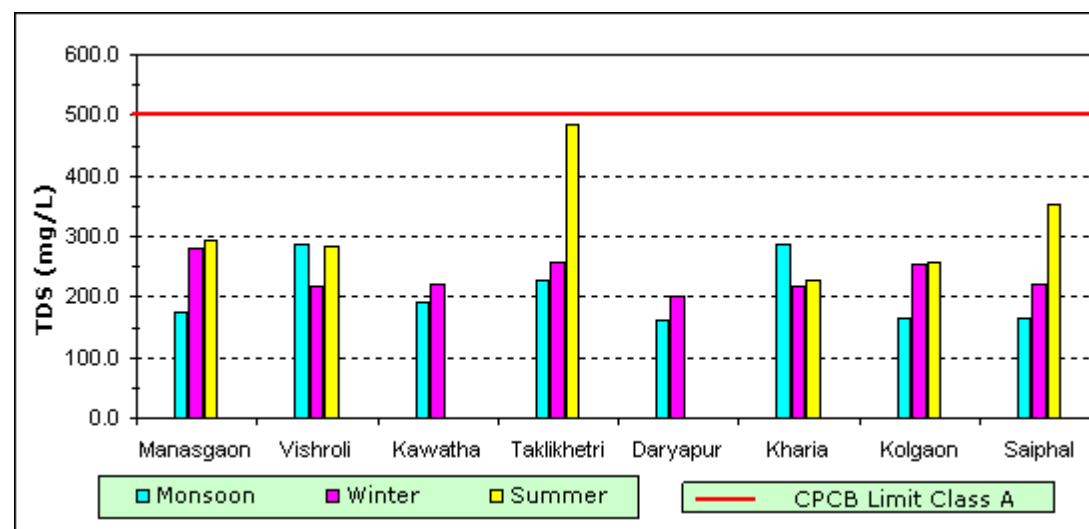
**Graph Showing Variation in BOD for the year 2010-2011**



**Graph Showing Variation in COD for the year 2010-2011**



**Graph Showing Variation in TDS for the year 2010-2011**



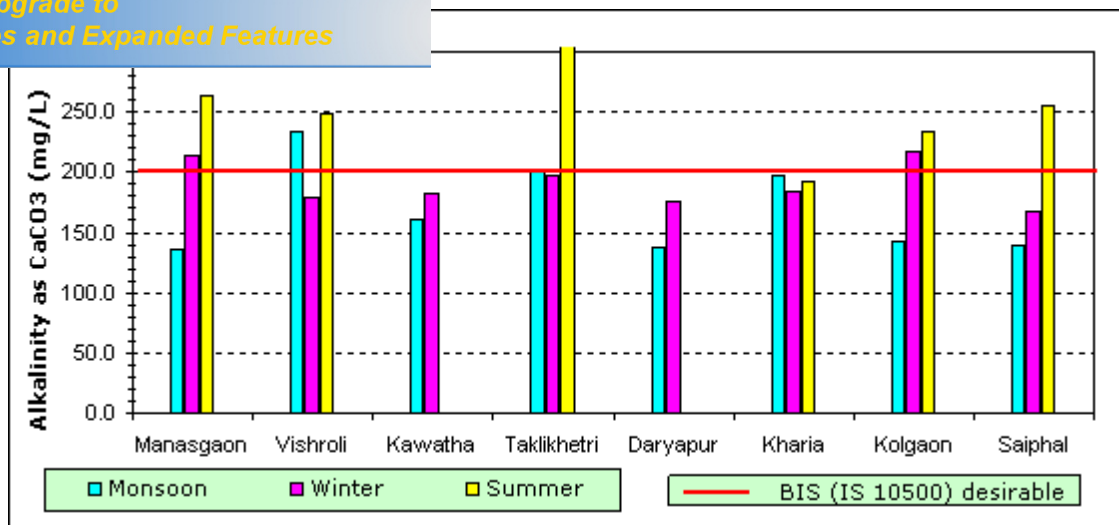


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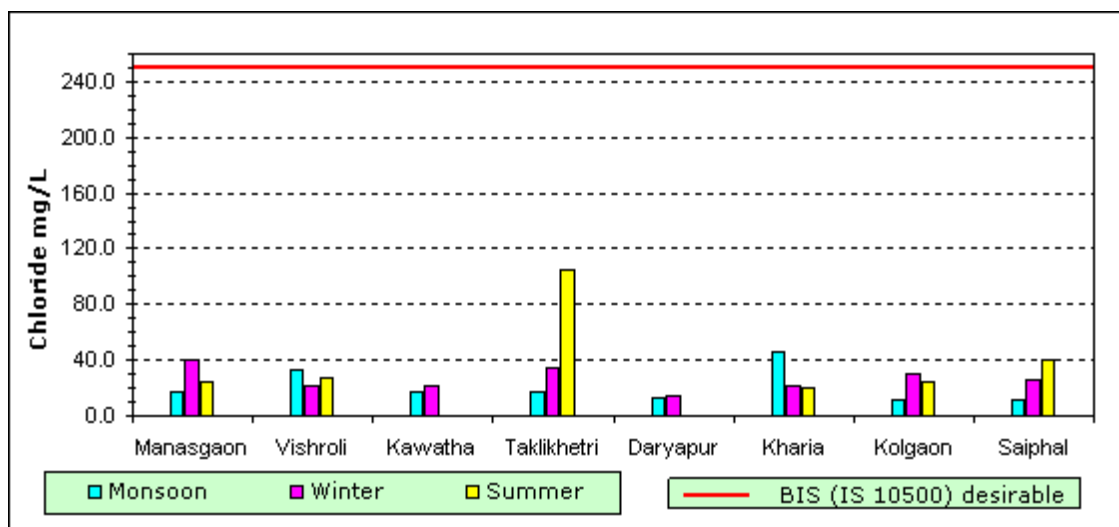
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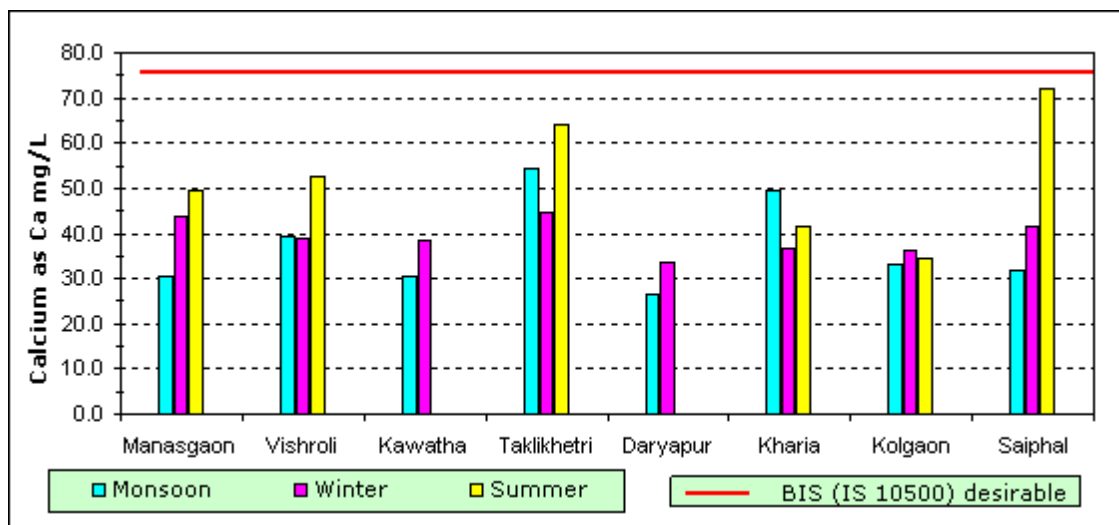
**Graph Showing Variation in Alkalinity for the year 2010-2011**



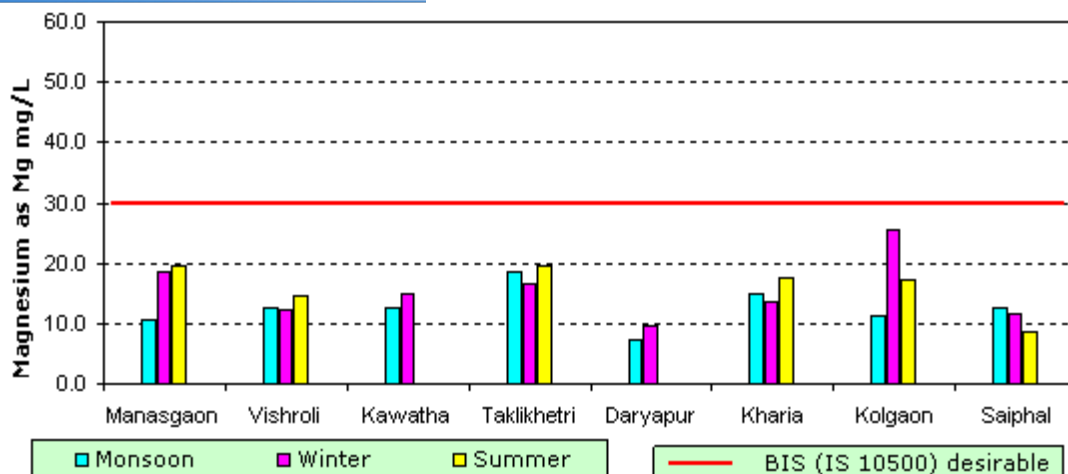
**Graph Showing Variation in Chloride for the year 2010-2011**



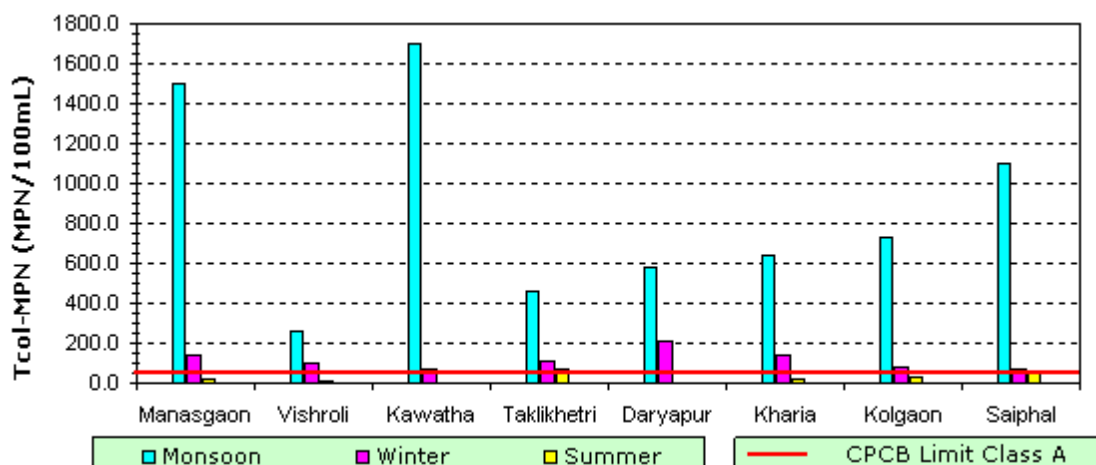
**Graph Showing Variation in Calcium as Ca for the year 2010-2011**



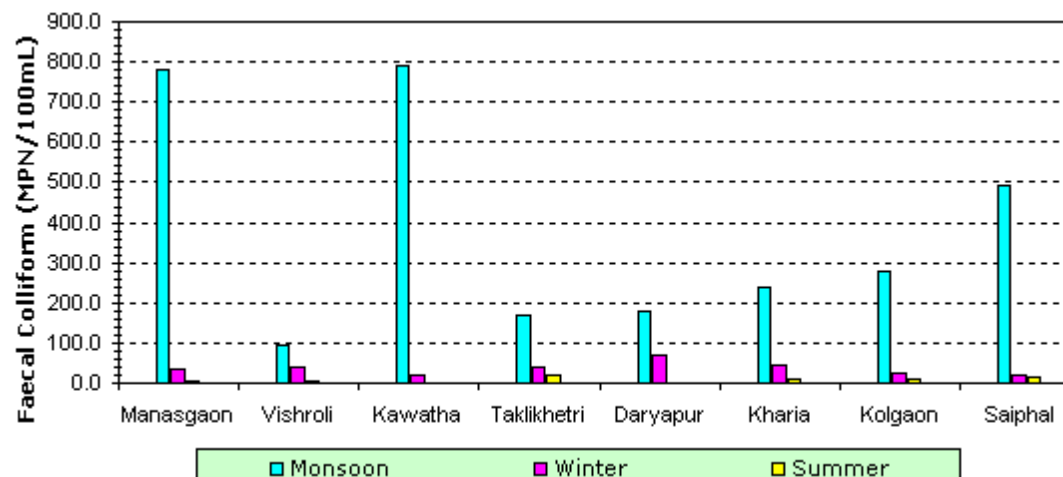
### in Magnesium as Mg for the year 2010-2011



### Graph Showing Variation in Total Colliforms for the year 2010-2011



### Graph Showing Variation in Faecal Colliforms for the year 2010-2011





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# CT FOR RIVER WARDHA FOR 2010-2011

## Station: Drugwada

No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	269.5	230.0	389.0
3	DO	mg/L	6.4	6.8	7.4
4	BOD	mg/L	3.0	3.0	2.8
5	COD	mg/L	11.5	11.0	9.0
6	TDS	mg/L	164.0	138.0	228.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	156.0	132.0	192.0
8	Chloride	mg/L	11.5	10.0	20.0
9	Calcium (as Ca)	mg/L	22.4	27.2	38.4
10	Magnesium (as Mg)	mg/L	16.0	6.8	16.5
11	Total colliforms	MPN/100 ml	374.5	34.0	21.0
12	Faecal colliforms	MPN/100 ml	121.0	11.0	7.0

## Station: WarudbBagaji

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	7.9	8.3	8.4
2	EC	µmhos/cm	308.3	335.0	418.3
3	DO	mg/L	6.3	6.9	6.3
4	BOD	mg/L	3.1	2.8	2.9
5	COD	mg/L	12.3	9.8	10.0
6	TDS	mg/L	178.7	199.6	253.3
7	Alkalinity	mg/L as CaCO <sub>3</sub>	141.3	180.0	236.0
8	Chloride	mg/L	17.0	18.4	19.7
9	Calcium (as Ca)	mg/L	30.9	34.2	39.5
10	Magnesium (as Mg)	mg/L	8.4	13.8	15.2
11	Total colliforms	MPN/100 ml	816.7	86.6	11.0
12	Faecal colliforms	MPN/100 ml	301.0	38.8	2.3

## Station: SoitDindora

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	315.0	408.6	426.7
3	DO	mg/L	6.4	6.9	6.4
4	BOD	mg/L	3.2	3.0	3.3
5	COD	mg/L	13.3	11.4	12.0
6	TDS	mg/L	184.5	244.0	258.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	165.0	216.8	238.7
8	Chloride	mg/L	13.8	28.4	24.0
9	Calcium (as Ca)	mg/L	29.6	33.9	33.1
10	Magnesium (as Mg)	mg/L	14.6	25.1	19.0
11	Total colliforms	MPN/100 ml	665.0	105.4	9.7
12	Faecal colliforms	MPN/100 ml	268.3	30.8	2.3

Station: Dhaba					
		Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.0	8.3	8.4
2	EC	µmhos/cm	315.5	455.0	574.0
3	DO	mg/L	5.5	6.4	5.8
4	BOD	mg/L	4.1	3.5	4.0
5	COD	mg/L	15.3	14.0	15.7
6	TDS	mg/L	185.5	268.4	352.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	133.0	213.6	257.3
8	Chloride	mg/L	27.0	37.8	51.3
9	Calcium (as Ca)	mg/L	26.0	39.4	47.5
10	Magnesium (as Mg)	mg/L	10.7	23.1	27.5
11	Total colliforms	MPN/100 ml	547.5	247.8	32.7
12	Faecal colliforms	MPN/100 ml	160.0	74.0	11.0
DATA ABSTRACT FOR RIVER PUS FOR 2010-2011					
Station: Anantwadi					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.4	8.4
2	EC	µmhos/cm	417.0	348.8	586.3
3	DO	mg/L	5.7	7.1	6.2
4	BOD	mg/L	3.6	2.8	3.5
5	COD	mg/L	15.3	9.6	14.3
6	TDS	mg/L	246.7	209.6	353.3
7	Alkalinity	mg/L as CaCO <sub>3</sub>	152.0	175.2	268.0
8	Chloride	mg/L	41.3	22.0	40.7
9	Calcium (as Ca)	mg/L	43.2	36.8	67.2
10	Magnesium (as Mg)	mg/L	11.7	15.4	12.8
11	Total colliforms	MPN/100 ml	446.7	211.0	22.3
12	Faecal colliforms	MPN/100 ml	160.0	67.6	6.0
DATA ABSTRACT FOR RIVER PRANHITA FOR 2010-2011					
Station: Mahagaon					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.3
2	EC	µmhos/cm	273.5	357.0	406.0
3	DO	mg/L	6.3	7.1	7.3
4	BOD	mg/L	3.3	2.8	2.9
5	COD	mg/L	11.5	9.0	11.0
6	TDS	mg/L	161.0	218.0	234.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	132.0	164.0	176.0
8	Chloride	mg/L	23.0	36.0	31.0
9	Calcium (as Ca)	mg/L	16.0	33.6	38.4
10	Magnesium (as Mg)	mg/L	8.3	13.6	17.5
11	Total colliforms	MPN/100 ml	320.0	130.0	14.0
12	Faecal colliforms	MPN/100 ml	120.0	33.0	5.0





# **DATA ABSTRACT FOR RIVER INDRAVATI FOR 2010-2011**

## **Station: Damrencha**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.4	8.0
2	EC	µmhos/cm	137.5	105.0	160.0
3	DO	mg/L	6.8	7.0	6.2
4	BOD	mg/L	2.6	2.6	2.9
5	COD	mg/L	10.0	10.0	10.0
6	TDS	mg/L	85.0	64.0	94.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	84.0	60.0	84.0
8	Chloride	mg/L	6.5	7.0	8.0
9	Calcium (as Ca)	mg/L	13.6	9.6	16.0
10	Magnesium (as Mg)	mg/L	4.9	4.9	5.8
11	Total colliforms	MPN/100 ml	1270.0	40.0	7.0
12	Faecal colliforms	MPN/100 ml	305.0	14.0	2.0

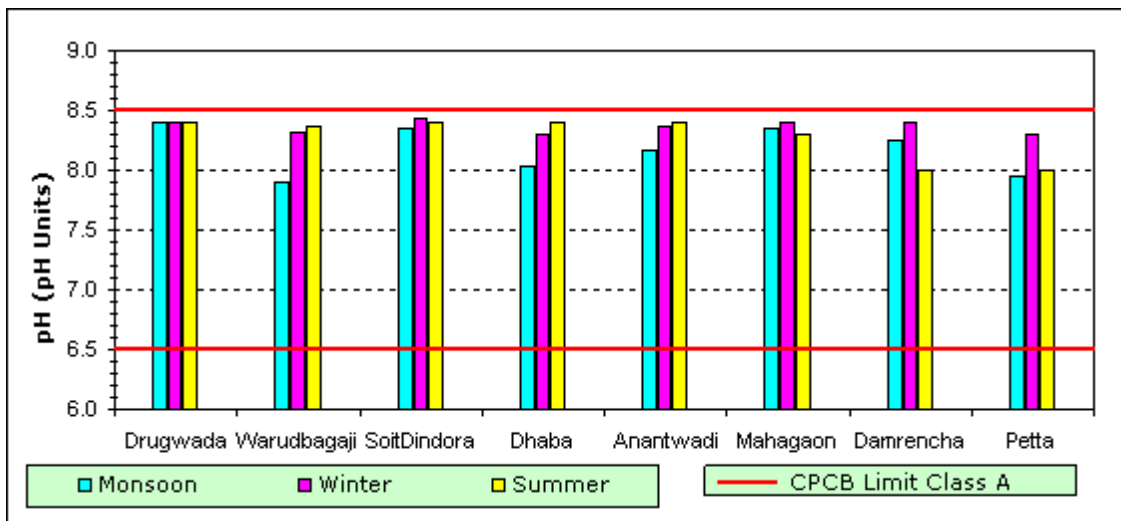
# **DATA ABSTRACT FOR RIVER BANDIA FOR 2010-2011**

## **Station: Petta**

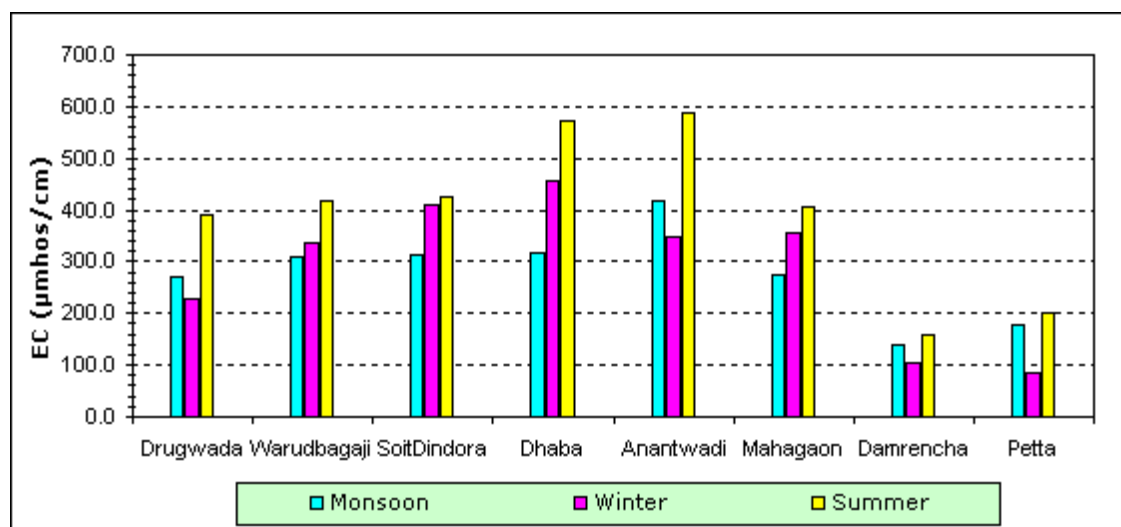
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.0	8.3	8.0
2	EC	µmhos/cm	179.5	86.0	200.0
3	DO	mg/L	6.7	7.2	6.4
4	BOD	mg/L	2.7	2.6	2.9
5	COD	mg/L	10.5	9.0	11.0
6	TDS	mg/L	106.0	52.0	118.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	96.0	52.0	104.0
8	Chloride	mg/L	12.0	5.0	9.0
9	Calcium (as Ca)	mg/L	12.8	6.4	27.2
10	Magnesium (as Mg)	mg/L	7.3	3.9	3.9
11	Total colliforms	MPN/100 ml	565.0	27.0	0.0
12	Faecal colliforms	MPN/100 ml	166.5	8.0	0.0



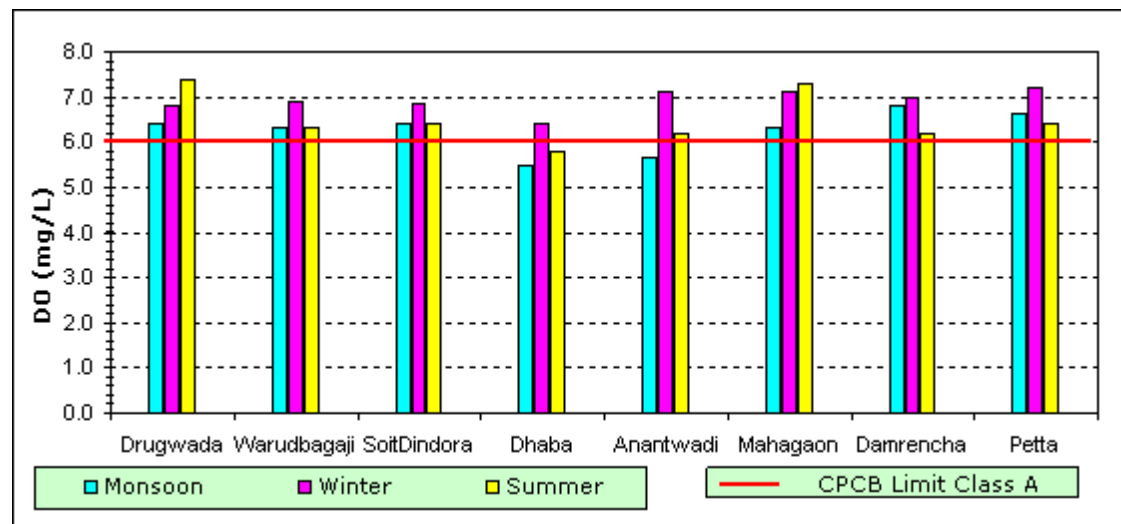
**ariation in pH for the year 2010-2011**



**Graph Showing Variation in EC for the year 2010-2011**



**Graph Showing Variation in Dissolved Oxygen for the year 2010-2011**



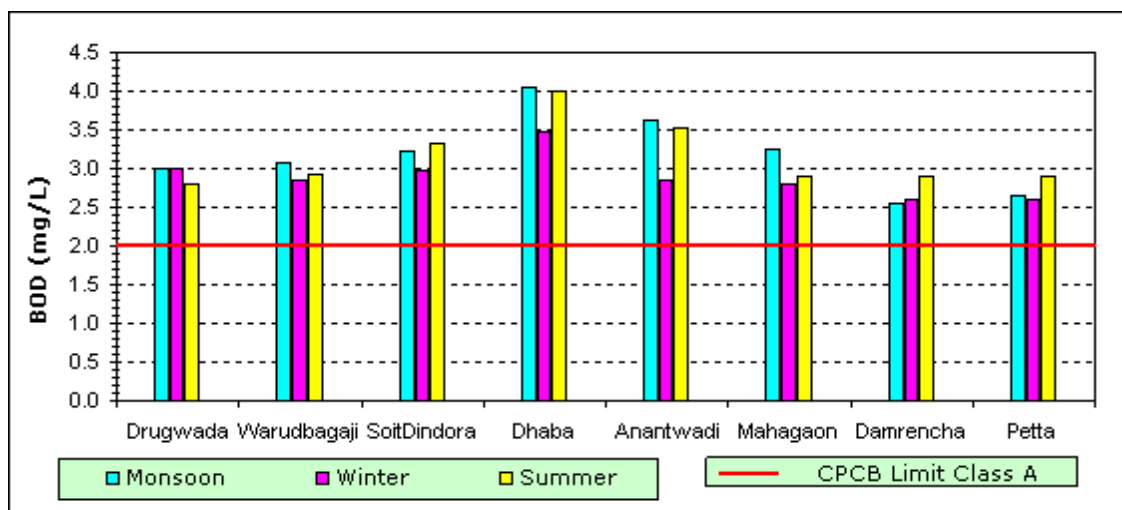


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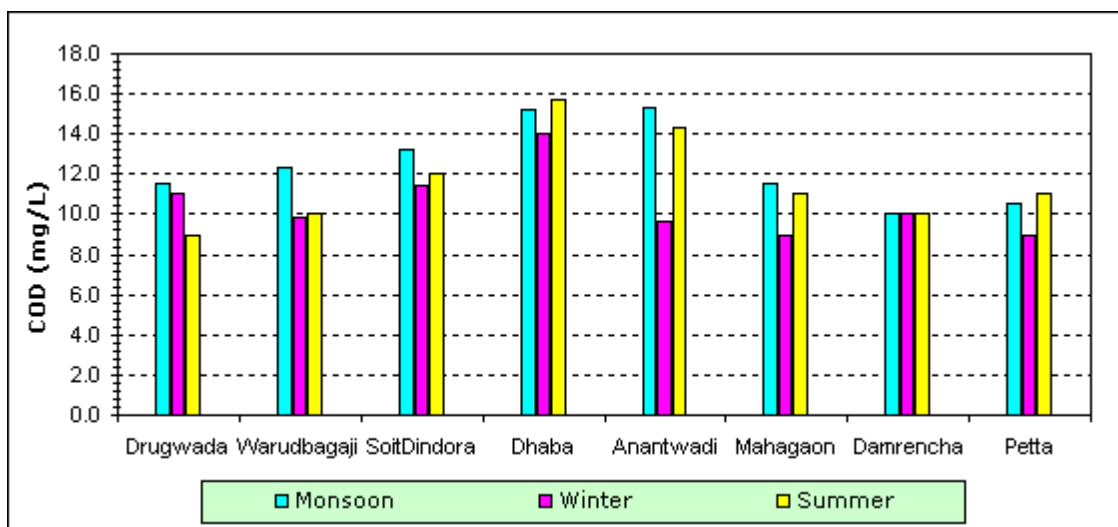
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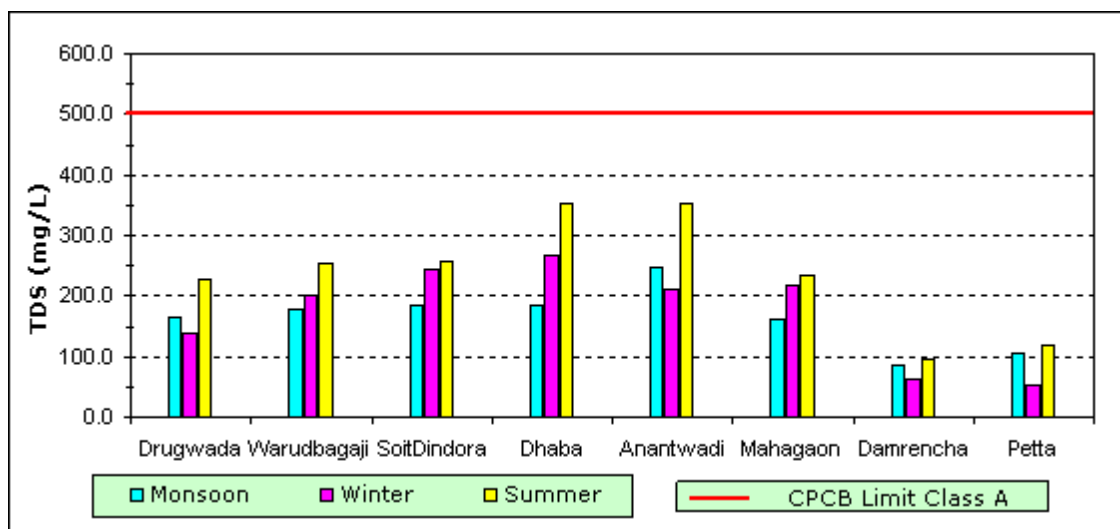
**Graph Showing variation in BOD for the year 2010-2011**



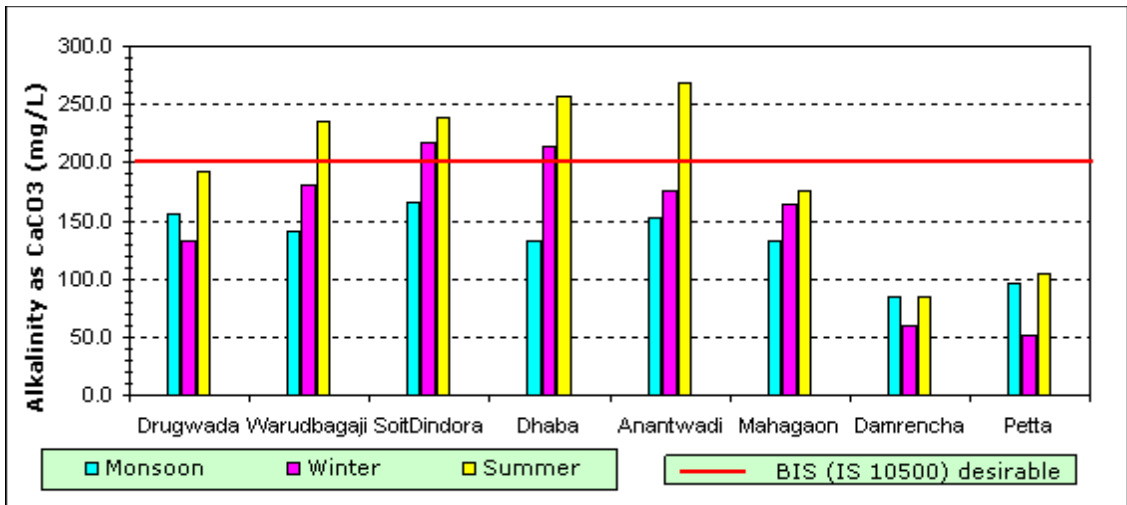
**Graph Showing Variation in COD for the year 2010-2011**



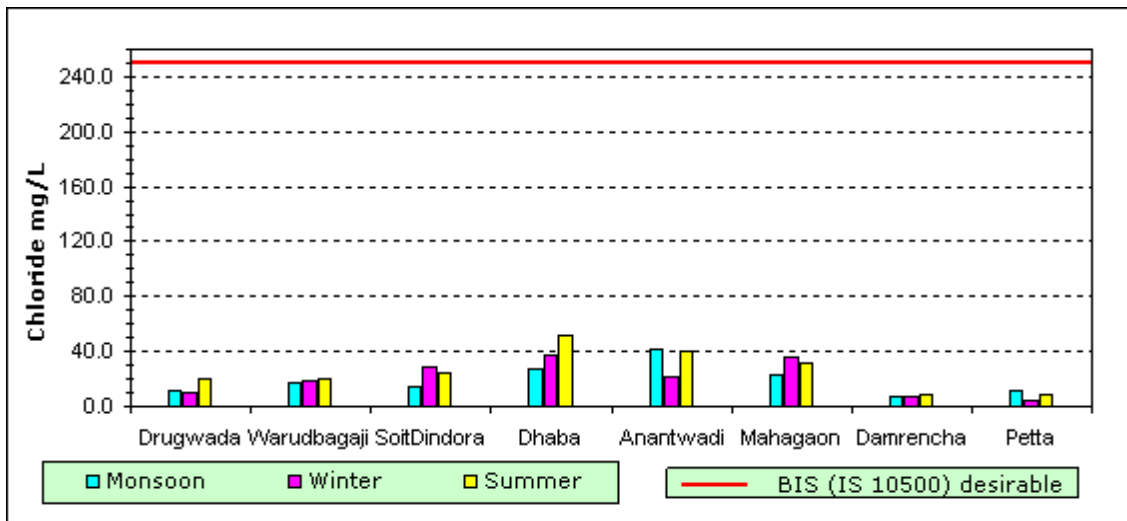
**Graph Showing Variation in TDS for the year 2010-2011**



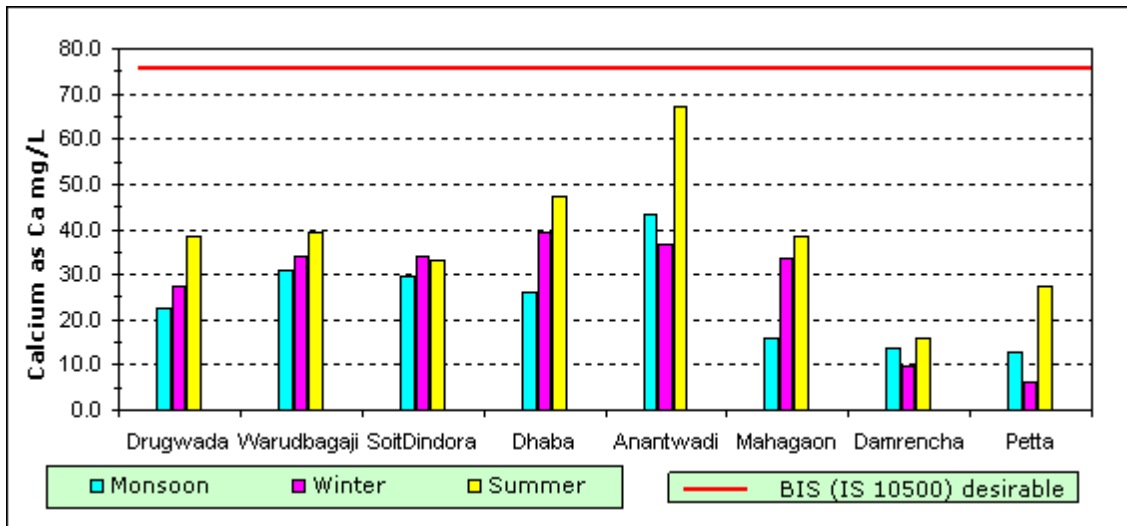
**Graph Showing Variation in Alkalinity for the year 2010-2011**



**Graph Showing Variation in Chloride for the year 2010-2011**



**Graph Showing Variation in Calcium as Ca for the year 2010-2011**



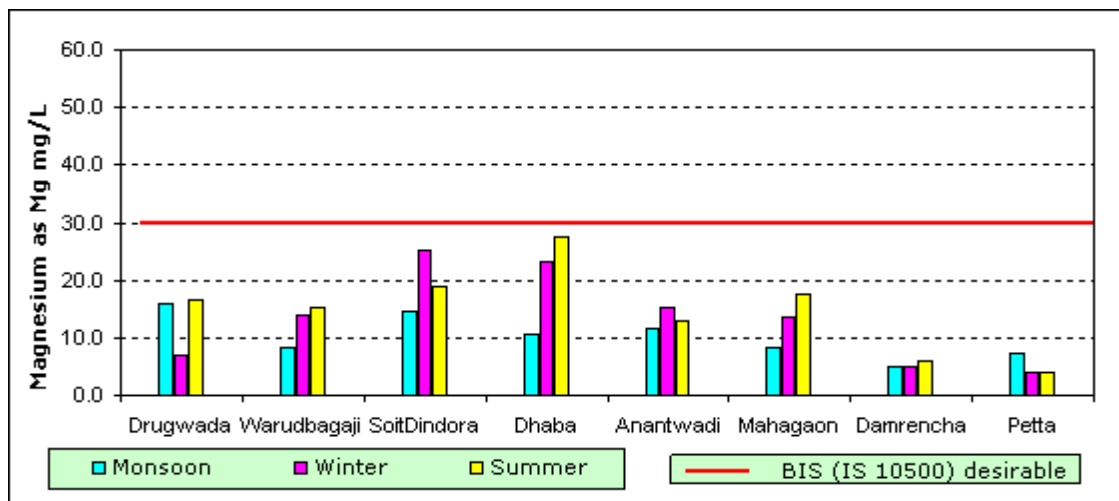


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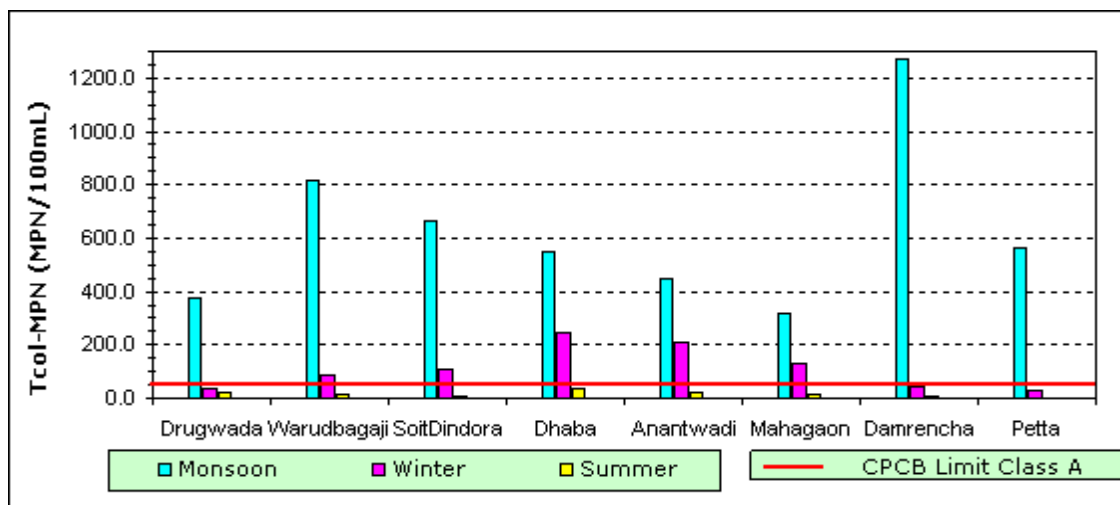
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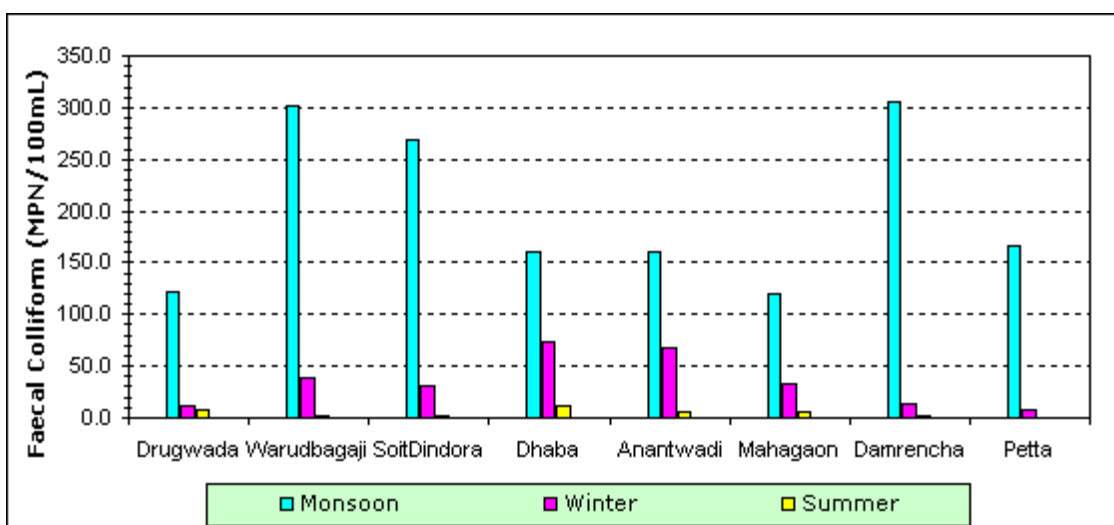
**Graph Showing Variation in Magnesium as Mg for the year 2010-2011**



**Graph Showing Variation in Total Colliforms for the year 2010-2011**



**Graph Showing Variation in Faecal Colliforms for the year 2010-2011**





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# **ACT FOR RESERVOIR FOR 2010-2011**

## **Station: Chapdoh**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.4
2	EC	µmhos/cm	295.5	388.8	480.2
3	DO	mg/L	6.3	6.9	6.3
4	BOD	mg/L	3.2	3.1	3.6
5	COD	mg/L	12.4	11.2	13.7
6	TDS	mg/L	176.3	232.4	291.3
7	Alkalinity	mg/L as CaCO <sub>3</sub>	148.0	200.8	226.0
8	Chloride	mg/L	14.9	23.6	41.0
9	Calcium (as Ca)	mg/L	28.8	41.0	40.5
10	Magnesium (as Mg)	mg/L	10.3	14.4	18.0
11	Total coliforms	MPN/100 ml	446.6	92.4	11.0
12	Faecal coliforms	MPN/100 ml	146.3	32.4	3.3

## **Station: Katepurna**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.1	8.3	8.4
2	EC	µmhos/cm	411.6	376.3	457.2
3	DO	mg/L	6.2	6.8	6.5
4	BOD	mg/L	3.2	3.0	3.4
5	COD	mg/L	12.6	10.4	13.0
6	TDS	mg/L	245.3	225.6	276.3
7	Alkalinity	mg/L as CaCO <sub>3</sub>	189.5	190.0	227.3
8	Chloride	mg/L	24.5	22.6	28.0
9	Calcium (as Ca)	mg/L	46.8	41.3	44.8
10	Magnesium (as Mg)	mg/L	11.4	15.0	16.2
11	Total coliforms	MPN/100 ml	132.3	64.7	10.8
12	Faecal coliforms	MPN/100 ml	55.1	21.1	2.0



Station: Pench					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.4	8.3
2	EC	µmhos/cm	315.6	235.1	298.3
3	DO	mg/L	6.4	7.2	6.4
4	BOD	mg/L	2.9	2.7	3.0
5	COD	mg/L	11.3	8.7	11.3
6	TDS	mg/L	188.0	143.0	181.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	156.0	122.4	158.0
8	Chloride	mg/L	15.5	13.3	15.5
9	Calcium (as Ca)	mg/L	32.8	28.8	36.7
10	Magnesium (as Mg)	mg/L	9.6	8.1	8.4
11	Total coliforms	MPN/100 ml	401.3	84.8	1.2
12	Faecal coliforms	MPN/100 ml	138.6	33.0	0.3
Station: Upperwardha					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.3
2	EC	µmhos/cm	261.9	289.9	373.8
3	DO	mg/L	6.3	7.1	6.5
4	BOD	mg/L	2.9	2.8	3.8
5	COD	mg/L	11.4	9.6	13.7
6	TDS	mg/L	156.3	174.4	226.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	136.0	150.0	198.0
8	Chloride	mg/L	11.0	14.8	22.2
9	Calcium (as Ca)	mg/L	26.4	31.0	38.0
10	Magnesium (as Mg)	mg/L	9.5	12.1	12.9
11	Total coliforms	MPN/100 ml	325.8	43.4	4.8
12	Faecal coliforms	MPN/100 ml	109.0	15.3	1.2



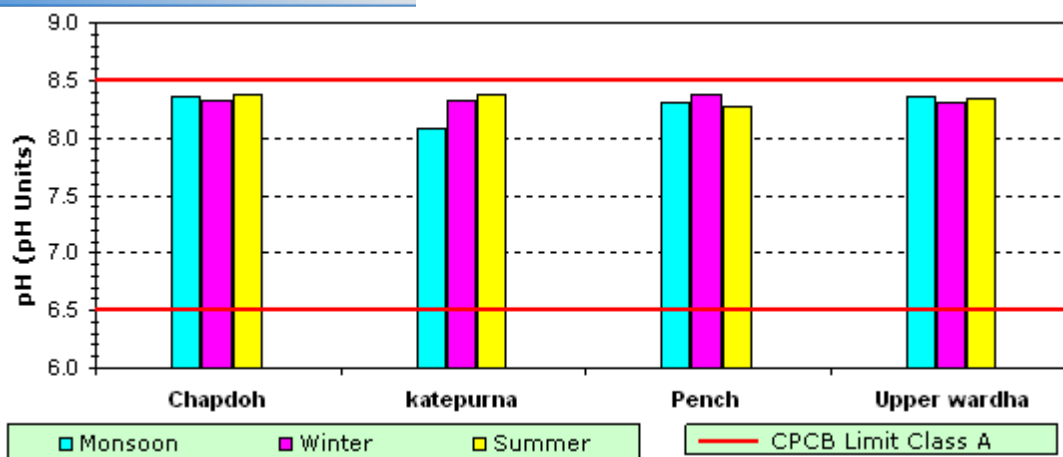


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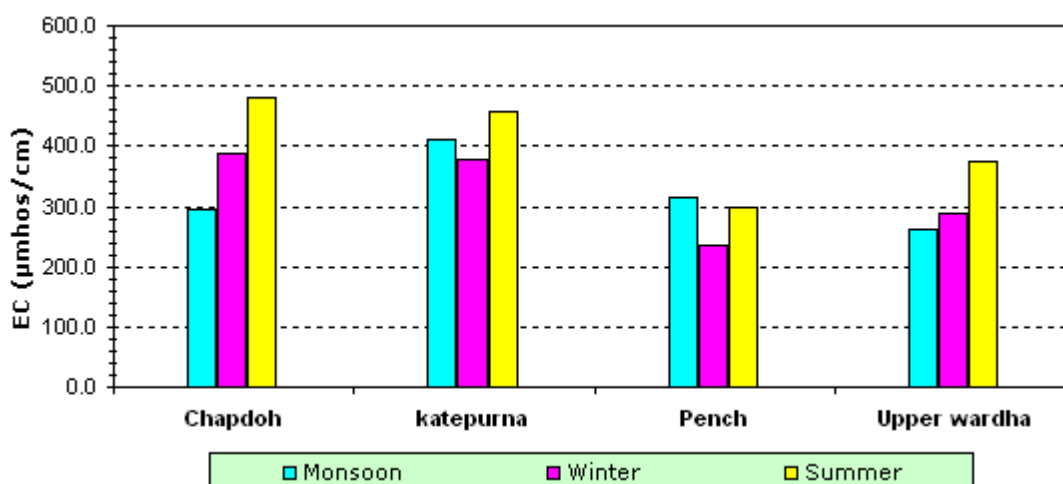
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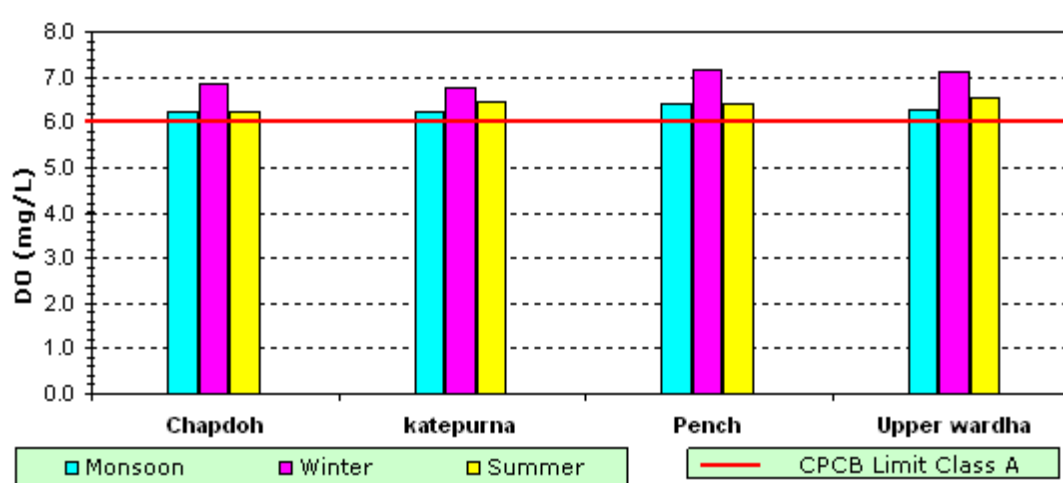
Graph Showing Variation in pH for the year 2010-2011



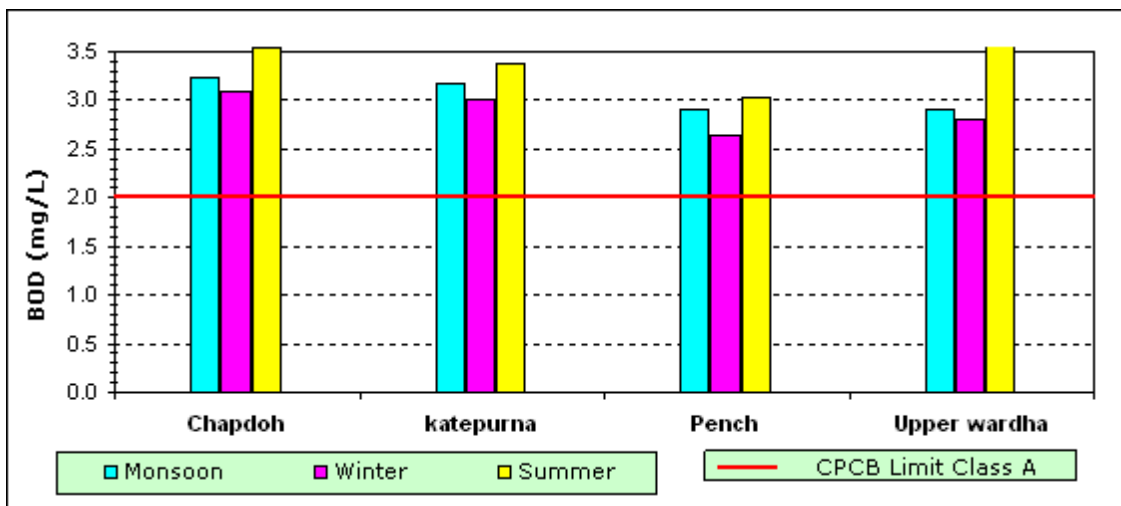
Graph Showing Variation in EC for the year 2010-2011



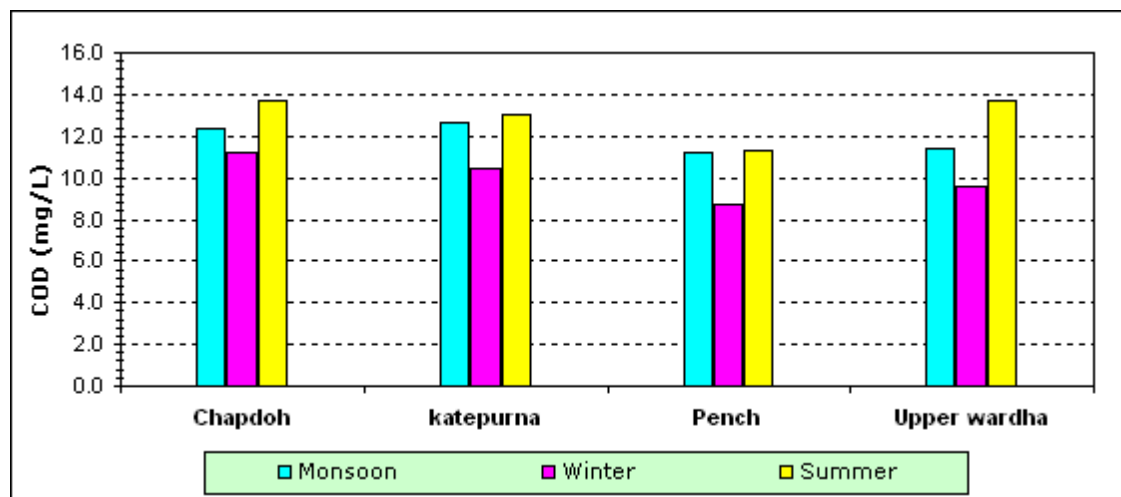
Graph Showing Variation in Dissolved Oxygen for the year 2010-2011



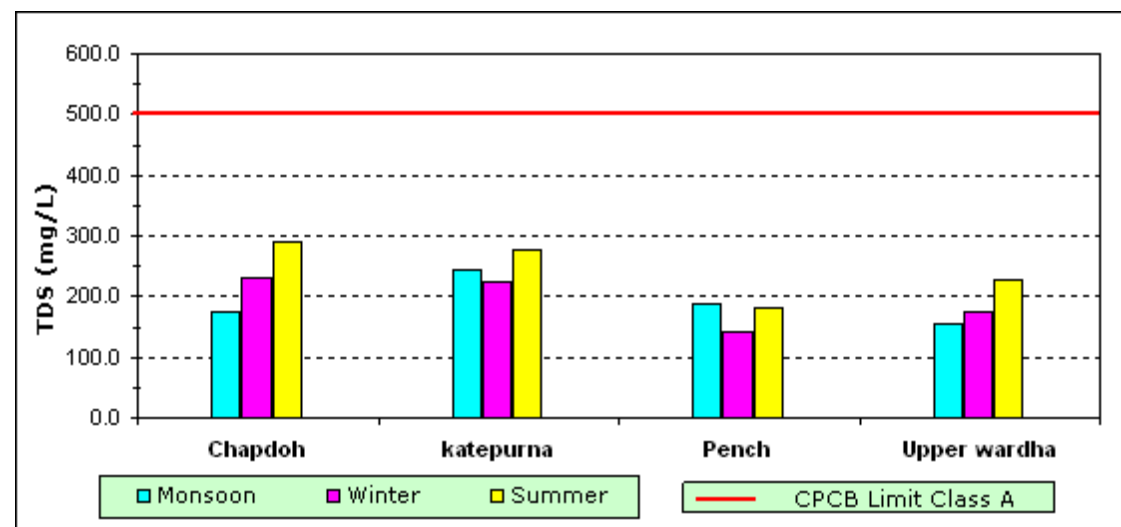
**Variation in BOD for the year 2010-2011**



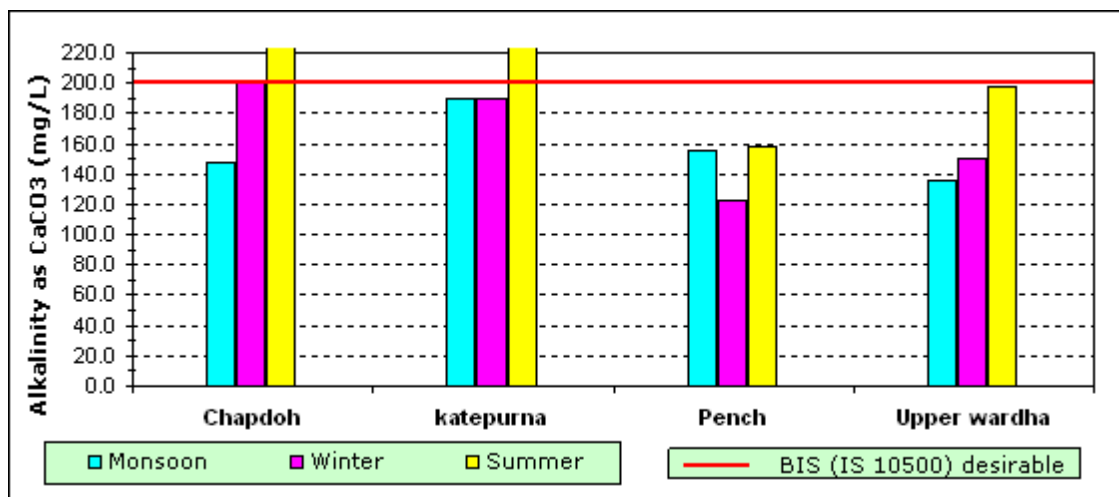
**Graph Showing Variation in COD for the year 2010-2011**



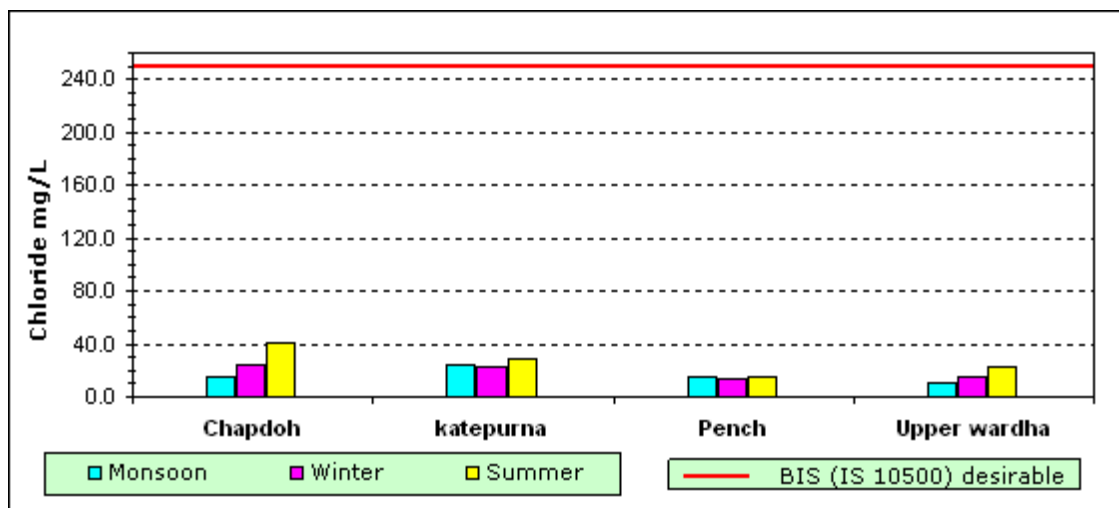
**Graph Showing Variation in TDS for the year 2010-2011**



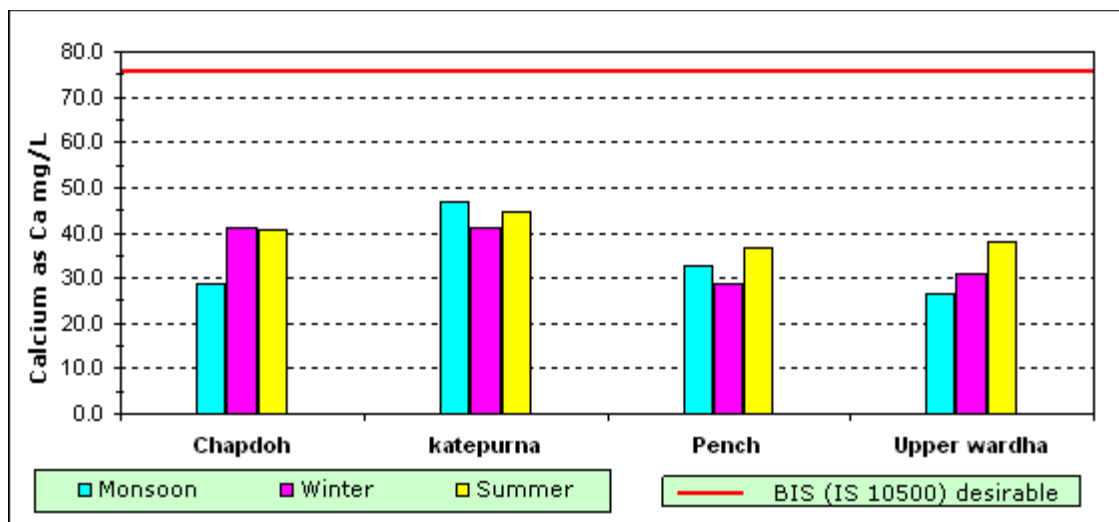
**Graph Showing variation in Alkalinity for the year 2010-2011**



**Graph Showing Variation in Chloride for the year 2010-2011**



**Graph Showing Variation in Calcium as Ca for the year 2010-2011**



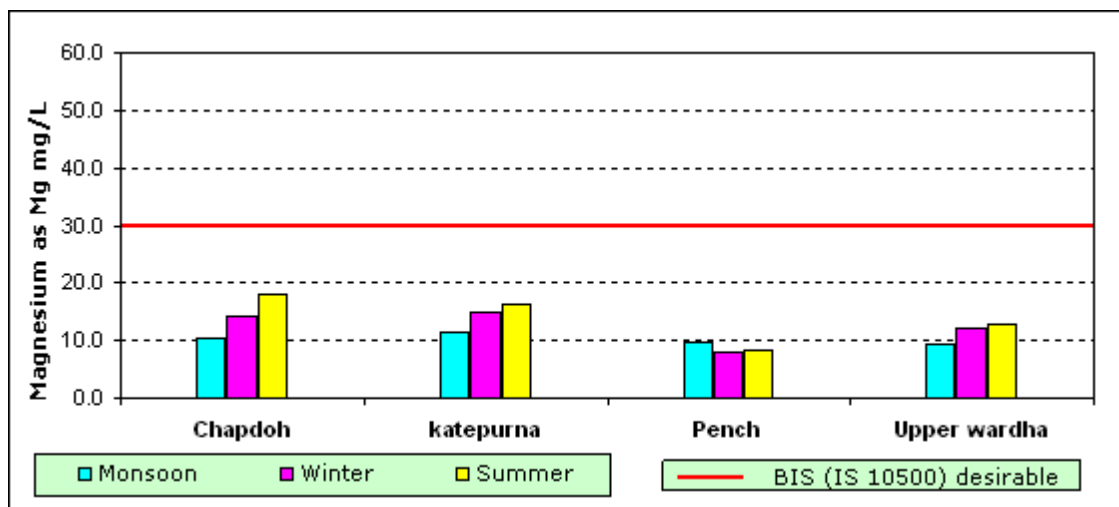


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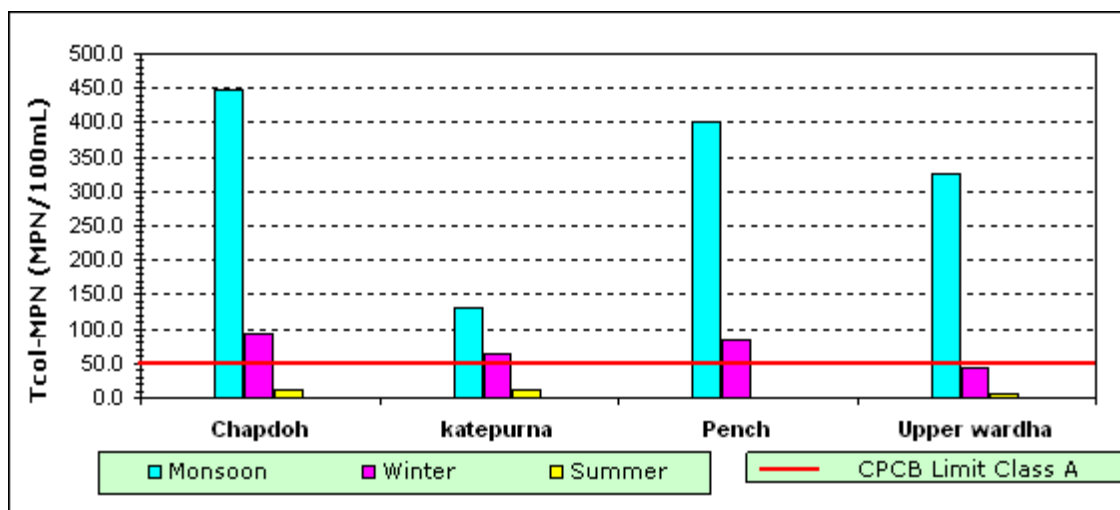
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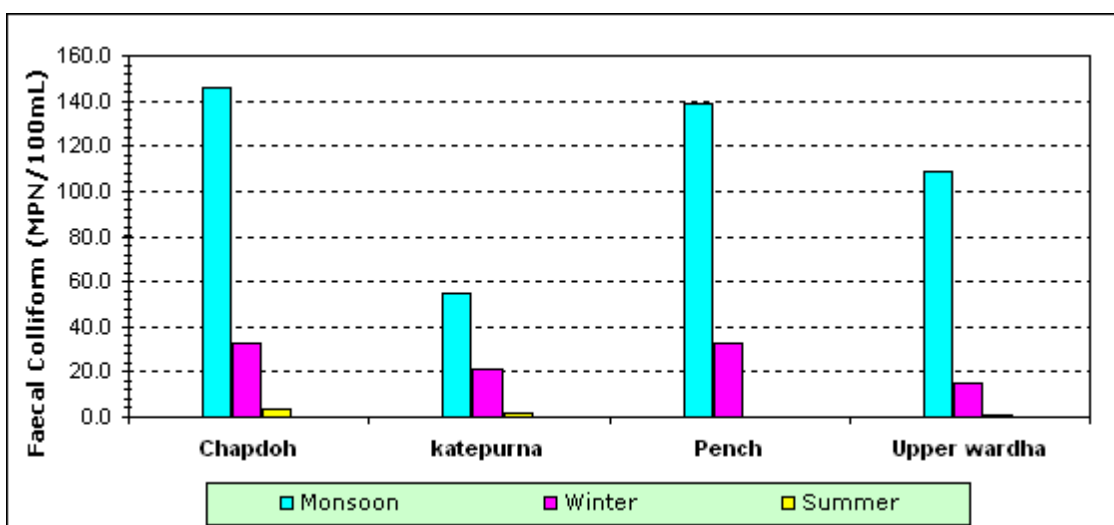
**Graph Showing Variation in Magnesium as Mg for the year 2010-2011**



**Graph Showing Variation in Total Colliforms for the year 2010-2011**



**Graph Showing Variation in Faecal Colliforms for the year 2010-2011**



### Summary of Result on the basis of Graph (2010 - 2011)

Sr. No.	Name of the Parameters	Tolerance Limit	Name of Critical Location Identified			Remark
1	pH	6.5 to 8.5	Sr. No.	Locations	Results	
			1	Daryapur	8.7	
			2	PENCH	8.6	
			3	SoitDindora	8.7	
			4	WagholiButi	8.7	
2	Biological Oxygen Demand (3 days at 27°C)	2 mg/L	Sr. No.	Locations	Results	
			1	Anantwadi	4.4	
			2	CHAPDOH	4.2	
			3	Damrencha	2.9	
			4	Daryapur	3.8	
			5	Deori	3.4	
			6	Dhaba	4.8	
			7	Drugwada	3.0	
			8	Kamthikhairi	3.0	
			9	Kardha	3.0	
			10	KATEPURNA	4.0	
			11	Kawatha	3.2	
			12	Khariya	4.2	
			13	KolgaonGod	4.0	
			14	Mahagaon	3.9	
			15	Manasgaon	3.8	
			16	Mathani	3.6	
			17	PENCH	3.4	
			18	Petta	2.9	
			19	Saiphal	3.4	
			20	Saiphal	3.4	
			21	SoitDindora	3.6	
			22	Takli Khetri	3.8	
			23	Tembhurdoh	3.2	



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	24	UPPERWARDHA	4.0	
	25	Vishroli	4.0	
	26	WadsaChinch	4.0	
	27	WagholiButi	3.4	
	28	WarudBagaji	3.2	



			Concentration	Name of Critical Location Identified			Remark
				Sr. No.	Locations	Results	
	3	Dissolved Oxygen	>5 mg/L		Dhaba	4.0	
					Khariya	4.7	
4	Alkalinity	200 mg/L		Sr. No.	Locations	Results	
				1	Anantwadi	284.0	
				2	CHAPDOH	260.0	
				3	Dhaba	280.0	
				4	Kamthikhairi	344.0	
				5	KATEPURNA	260.0	
				6	Manasgaon	264.0	
				7	Saiphall	256.0	
				8	Saiphall	256.0	
				9	SoitDindora	256.0	
				10	Takli Khetri	308.0	
				11	Tembhurdoh	328.0	
				12	Vishroli	328.0	
5	Magnesium (as Mg)	30 mg/L		Sr. No.	Locations	Results	
				1	Dhaba	34.0	
				2	KolgaonGod	30.1	
				3	Takli Khetri	30.1	
				4	Tembhurdoh	32.1	



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Sl. No.	Sample Name	Sample Type	Sample Volume	Sample Date	Sample Time	Sample Location	Name of Critical Location Identified			Remark
							Sr. No.	Locations	Results	
6	Total Colliforms	50 MPN/100 ml					1	Anantwadi	700	
							2	CHAPDOH	940	
							3	Damrencha	1600	
							4	Daryapur	700	
							5	Deori	78	
							6	Dhaba	790	
							7	Drugwada	700	
							8	Kamthikhairi	460	
							9	Kardha	490	
							10	KATEPURNA	340	
							11	Kawatha	1700	
							12	Khariya	1200	
							13	KolgaonGod	1100	
							14	Mahagaon	470	
							15	Manasgaon	1700	
							16	Mathani	1100	
							17	PENCH	700	
							18	Petta	920	
							19	Saiphal	1100	
							20	Saiphal	1100	
							21	SoitDindora	1400	
							22	Takli Khetri	460	
							23	Tembhurdoh	490	
							24	UPPERWARDHA	700	
							25	Vishroli	390	
							26	WadsaChinch	700	
							27	WagholiButi	330	
							28	WarudBagaji	1300	





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			Prevalence at	Name of Critical Location Identified			Remark
				Sr. No.	Locations	Results	
7	Faecal Colliforms	Absent		1	Anantwadi	260	
				2	CHAPDOH	260	
				3	Damrencha	350	
				4	Daryapur	220	
				5	Deori	45	
				6	Dhaba	220	
				7	Drugwada	220	
				8	Kamthikhairi	170	
				9	Kardha	230	
				10	KATEPURNA	110	
				11	Kawatha	790	
				12	Khariya	460	
				13	KolgaonGod	5	
				14	Mahagaon	170	
				15	Manasgaon	700	
				16	Mathani	490	
				17	PENCH	260	
				18	Petta	240	
				19	Saiphal	490	
				20	Saiphal	14	
				21	SoitDindora	93	
				22	Takli Khetri	170	
				23	Tembhurdoh	170	
				24	UPPERWARDHA	110	
				25	Vishroli	140	
				26	WadsaChinch	9	
				27	WagholiButi	170	
				28	WarudBagaji	490	



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# CHAPTER – V

## CONCLUSION

## CONCLUSION

2010-2011

Observing all the factors it can be concluded that, analysis result from all the locations shows increase in value of Biological Oxygen Demand, Total Coliforms & Faecal Coliforms. And some other parameters like Alkalinity & Magnesium also crossing its Tolerance limit. The value of Biological Oxygen Demand is very high, even exceeding beyond desired limit is due to the presence of organic matter, which also reduces oxygen content in the water. Water having excess Biological Oxygen Demand is not fit for human activities or consumption.

Biological parameter in all locations contain higher bacterial count is due to the discharge of sewage, drainage waste in to the water sources. Even increase in human activities discharge bacteria of various type in to the water, which increase the number of count in the water.

### 5.2 REMEDIAL MESAURES:

- Use of such water for salt tolerance crop is recommended based on special study.
- Before letting out to the down stream reservoir such source of water to be taken into consideration for the specific use.
- Classification of source may be as per use of water for irrigation based on Sodium Absorption Ratio, Percent Sodium, and Residual Sodium Carbonate.
- Effluent from non point sources to be treated before discharging into the river.
- Use of direct source of water to be avoided.
- Bathing at such location should be restricted.



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## CHAPTER – VI

### OTHER ACTIVITIES

## OTHER ACTIVITIES OF Lab. level – II, Nagpur

### TO GOVERNMENT OF MAHARASHTRA

Apart from monitoring of water quality network for Water Quality lab level II at Nagpur, the infrastructure facility and services of the lab are made available to the users from various Government, Non Government, Private sector as well as individuals.

The facility is availed by many users with testing of sample towards drinking purpose, irrigation purpose & study purpose.

During the year 2010-2011 many clients approached to the laboratory.

**Effluent Samples Collected from Koradi Thermal Power Station, KORADI.**

### REVENUE GENERATED DURING THE PERIOD

Sr. No.	Year	No. of Samples	Amount Received
1.	2010-2011	<b>257</b>	<b>Rs.77,501</b>

**The valuable Clientele who availed the facility of the laboratory is as below;**

- 1 Mr. Pratap Reddy, DGM, Lanco Vidarbha Thermal Power Limited
- 2 R.N.Kirkte, M.Tech Student, Nagpur
- 3 P.G.Patil, M.Tech Student, Nagpur
- 4 Mr.Ashish D. Bhramankar, Student of M.Sc.II (Pure) P.G.Department of Geology R.T.M.Nagpur University, Nagpur
- 5 Mr. Nandeshwar H. Borkar, Student of M.Sc.II (Pure) P.G.Department of Geology R.T.M.Nagpur University, Nagpur
- 6 Gram Aarogya Poshan va Paani Purvatha Swachta Samiti, Siraspur Tal:Chimmur Dist:Chandrapur
- 7 Dr. P.R.Bajaj Principal of G.H.Raisoni College of Engineering CRPF Gate No:3 Hingna Road, Digdoh, Nagpur
- 8 Tulsiramji Gaikwad-Patil College of Engineering & Technology Mohgaon, Wardha Road, Nagpur
- 9 ABHA College of Engineering Mohgaon, Wardha Road, Nagpur
- 10 Mr.Ajay N.Burile M.Tech Student (Env.Engg), G.H.Raisoni College of Engineering, Nagpur
- 11 Avanti Institute of Cardiology Pvt.Ltd. 5,Abhyankar Road, Dhantoli, Nagpur-12
- 12 Assistant Divisional Engineer (Maintenance), Central Railway, Warora
- 13 S.B.Jain Institute of Technology, Management & Research, Katol Road, Nagpur.

...ech Student G.H.Raisoni College of Engineering Nagpur

...ent Medical College Nagpur

- 16 Mr. S.N.Wankhede Sr.Section Engineer (W) C.Railway - Warora
- 17 Mr.Dipak G. Mangrulkar (M.Tech Student, R.T.M.Nagpur University)
- 18 Sub Divisional Engineer Irrigation Sub Division. Nagpur
- 19 Mangalam Icon Condominium, Shivaji Nagar Nagpur
- 20 Sub Divisional Engineer, Rural Water Supply, Sub Division, Z.P. Sindevahi Tal: Nagbhid, Dist: Chandrapur
- 21 Senior Section Engineer (Works), Central Railway .Warora
- 22 Mr. R. L. Rodriques, C/O V.A.Thomas , 19-A.Redross Road, Sadar. Nagpur.
- 23 Director M/s. BHLA ENTERPRISES PVT. LTD. "Krishana House" 71/A ,S. T. Bus Stand Road , Ganeshpeth , Nagpur - 440018
- 24 Sarika M. Mankar, M.tech student of Environmental Engineering G.H.Raisoni college, NAGPUR.
- 25 Vice Secretary, Jagat Towers Association, NAGPUR
- 26 Ku.Yogita V. Badge Ph.D. Student, R.T.M. Nagpur University
- 27 Ku.Kiran Borkar, P.hd. Student, Dist.Chandrapur
- 28 Dr.A.M.Ittadwar, Principal, Grunanak college of pharmacy, Nari, Kamptee Road, Nagpur
- 29 Mr. Prakash P. Shrikhande, M.tech student, GHRCE.
- 30 Mr. Nilkant Awghate, Shweta Paper Ind. Pvt. Ltd., Udyog Nagar, Bhandar
- 31 Mr. Mayur A. Jirapure, M.Tech Student, G.H.Raisoni college of Engineering, Nagpur
- 32 Mr. Amit Kharwade M.tech student, G.H.Raisoni college of Enginnering, Nagpur
- 33 Mr.Amit Rathod Plot No. N-3, Reshimbagh, Nagpur-9
- 34 Mr. Mangesh P. Bhorkar, M.tech student, MIET, Gondia.

**activities:**

logy project sub division, Nagpur.

Government Analyst, Water Quality Lab Level-II, Nagpur and All employees of Water Quality Lab Level-II, Nagpur. participated in two days wokshop in Nashik organized by Superintending Engineer, Nashik, in which discussions were done among the employees of all Water Quality Labs Level-II, of HP Maharashtra related to the problems and their solutions during working in Laboratory.

# Annual Report

## Water Quality Monitoring through Water Quality Lab Level-II Nagpur for the Year 2010-2011

### ANNEXURES

Chapter	Particulars	Page No.
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4	Photographs of ISO 9001:2008 Recertification audit	77 – 78
5	Lay Out of Water Quality Lab level- II, Nagpur	79





## f Clients 2010 - 2011

	Name of Client	Purpose of Analysis
1	Mr. Pratap Reddy, DGM, Lanco Vidarbha Thermal Power Limited	Analysis for General Purpose
2	R.N.Kirkte, M.Tech Student, Nagpur	Analysis for General Purpose
3	P.G.Patil, M.Tech Student, Nagpur	Analysis for General Purpose
4	Mr.Ashish D. Bhramankar, Student of M.Sc.II (Pure) P.G.Department of Geology R.T.M.Nagpur University, Nagpur	Analysis for General Purpose
5	Mr. Nandeshwar H. Borkar, Student of M.Sc.II (Pure) P.G.Department of Geology R.T.M.Nagpur University, Nagpur	Analysis for General Purpose
6	Gram Aarogya Poshan va Paani Purvatha Swachta Samiti,Siraspur Tal:Chimmur Dist:Chandrapur	Analysis for General Purpose
7	Dr. P.R.Bajaj Principal of G.H.Raisoni College of Engineering CRPF Gate No:3 Hingna Road, Digdoh, Nagpur	Analysis for Drinking Purpose
8	Tulsiramji Gaikwad-Patil College of Engineering & Technology Mohgaon, Wardha Road, Nagpur	Analysis for General Purpose
9	ABHA College of Engineering Mohgaon, Wardha Road, Nagpur	Analysis for General Purpose
10	Mr.Ajay N.Burile M.Tech Student (Env.Engg), G.H.Raisoni College of Engineering, Nagpur	Analysis for General Purpose
11	Avanti Institute of Cardiology Pvt.Ltd. 5,Abhyankar Road, Dhantoli, Nagpur-12	Analysis for Drinking Purpose
12	Assistant Divisional Engineer (Maintenance), Central Railway, Warora	Analysis for General Purpose
13	S.B.Jain Institute of Technology, Management & Research, Katol Road, Nagpur.	Analysis for Drinking Purpose
14	Shubhangi H. Lokhande M.Tech Student G.H.Raisoni College of Engineering Nagpur	Analysis for General Purpose



## f Clients 2010 - 2011

	Name of Client	Purpose of Analysis
15	Mr. Dileep Helchel Government Medical College Nagpur	Analysis for General Purpose
16	Mr. S.N.Wankhede Sr.Section Engineer (W) C.Railway - Warora	Analysis for General Purpose
17	Mr.Dipak G. Mangrulkar (M.Tech Student, R.T.M.Nagpur University)	Analysis for General Purpose
18	Sub Divisional Engineer Irrigation Sub Division. Nagpur	Analysis for General Purpose
19	Mangalam Icon Condominium, Shivaji Nagar Nagpur	Analysis for Drinking Purpose
20	Sub Divisional Engineer, Rural Water Supply, Sub Division, Z.P. Sindevahi Tal: Nagbhid, Dist: Chandrapur	Analysis for General Purpose
21	Senior Section Engineer (Works), Central Railway .Warora	Analysis for General Purpose
22	Mr. R. L. Rodriques, C/O V.A.Thomas , 19-A.Redross Road, Sadar. Nagpur.	Analysis for Drinking Purpose
23	Director M/s. BHLA ENTERPRISES PVT. LTD. "Krishana House" 71/A ,S. T. Bus Stand Road , Ganeshpeth , Nagpur - 440018	Analysis for General Purpose
24	Sarika M. Mankar, M.tech student of Environmental Engineering G.H.Raisoni college, NAGPUR.	Analysis for General Purpose
25	Vice Secretary, Jagat Towers Association, NAGPUR	Analysis for General Purpose
26	Ku.Yogita V. Badge Ph.D. Student, R.T.M. Nagpur University	Analysis for General Purpose
27	Ku.Kiran Borkar, P.hd. Student, Dist.Chandrapur	Analysis for General Purpose
28	Dr.A.M.Ittadwar, Principal, Grunanak college of pharmacy, Nari, Kamptee Road, Nagpur	Analysis for Drinking Purpose



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## f Clients 2010 - 2011

No.	Name of Client	Purpose of Analysis
29	Mr. Prakash P. Shrikhande, M.tech student, GHRCE.	Analysis for General Purpose
30	Mr. Nilkant Awghate, Shweta Paper Ind. Pvt. Ltd., Udyog Nagar, Bhandar	Analysis for General Purpose
31	Mr. Mayur A. Jirapure, M.Tech Student, G.H.Raisoni college of Engineering, Nagpur	Analysis for General Purpose
32	Mr. Amit Kharwade M.tech student, G.H.Raisoni college of Enginnering, Nagpur	Analysis for General Purpose
33	Mr.Amit Rathod Plot No. N-3, Reshimbagh, Nagpur-9	Analysis for General Purpose
34	Mr. Mangesh P. Bhorkar, M.tech student, MIET, Gondia.	Analysis for General Purpose
35	M/S, Bhandara Zillha, dugdh utpadak sahkari sangh maryadit, Bhandar.	Analysis for General Purpose
36	Miss Monali W. Gotmare, M.tech student, Final year (envi engg), G.H.Raisoni coolege, Nagpur.	Analysis for General Purpose
37	Director,G.H.Raisoni college of Engineering, Nagpur.	Analysis for Drinking Purpose
38	Rama M.Nimje 123, Vitthalwadi, Hudkeshwar road, Nagpur.	Analysis for General Purpose
39	Principal, Shankarrao Dhawad Polytecnic, Rajive Nagar, Nagpur.	Analysis for General Purpose
40	Civil Department, S.D.M.P College, Nagpur.	Analysis for General Purpose
41	Chairman / Secretery, Gramin paani purvatha va swachhta samiti, Gram Panchayat: Chak Phutana, Dist: Chandrapur	Analysis for General Purpose
42	Government Polytechnic, Nagpur.	Analysis for General Purpose



## f Clients 2010 - 2011

NO.	Name of Client	Purpose of Analysis
43	Sr. Section Engineer ( W ), Central Railway, Warora.	Analysis for General Purpose
44	Mr. Deepak Kothari, 301, WHC Road, Dharampeth, Nagpur.	Analysis for General Purpose
45	Sub Divisional Officer, Lower vena cannal, Sub Division No. 6, Hinganghat	Analysis for General Purpose
46	Mr. Mangesh P. Bhorkar, M.tech student, MIET, Gondia.	Analysis for General Purpose
47	Prof. G.T. Paliwal, Deptt. Of Zoology, S.S. Jaiswal College, Arjuni / Morgaon, Dist : Gondia	Analysis for General Purpose
48	Mr. Vikas R. Agrawal, M.Tech Student, II nd Year, MIET, Gondia	Analysis for General Purpose
49	Miss. Snehal G. Juare Ph.D Student, R.T.M Nagpur University	Analysis for General Purpose
50	Shri. Roshan A. Rathod, Ph.D. student, R.T.M.Nagpur University.	Analysis for General Purpose
51	Miss. Mrunalini V. Khund, Ph.D. Student, R.T.M. Nagpur University	Analysis for General Purpose
52	M/s, S.K.Banerjee, Builders, Engineers & Contractors, 6th Floor "LANDMARK" Ramdaspath, Wardha Road, Nagpur-10	Analysis for General Purpose



## **WATER QUALITY LAB, LEVEL – II, NAGPUR**

### **HYDROLOGY PROJECT DIVISION, NAGPUR**

## **QUALITY POLICY**

Water Quality Lab, Level . II, Hydrology Project Division, Nagpur, has laid down the following Quality Policy:

- It is committed to monitor effectiveness of QMS time to time & will also work for continual improvement of the same.
- It is also committed to work for continual improvement in its technology, processes and to increase competency levels of its personnel.
- It is committed to delight the customer by fulfilling customer's requirement, statutory / regulatory requirements and requirement which is not stated by customer but which is required for application of its services.

**Sd/-**

Executive Engineer  
Hydrology Project Division  
Nagpur

## **TY LAB, LEVEL – II, NAGPUR**

### **PROJECT DIVISION, NAGPUR**

## **QUALITY OBJECTIVES**

Quality objectives are established at relevant functions and levels within the organisation. These include :

- The parameters of testing for which the analytical capability of the laboratory has not been established will be recorded for making efforts for improvement and widening the scope of services.
- Efforts will be made to enhance competence level of all employees at each level.
- Efforts will be made to increase the number of jobs.

**Reference: - Statement of Goals (QF/MR/12)**

**Sd/-**  
Executive Engineer.  
Hydrology Project Division  
Nagpur





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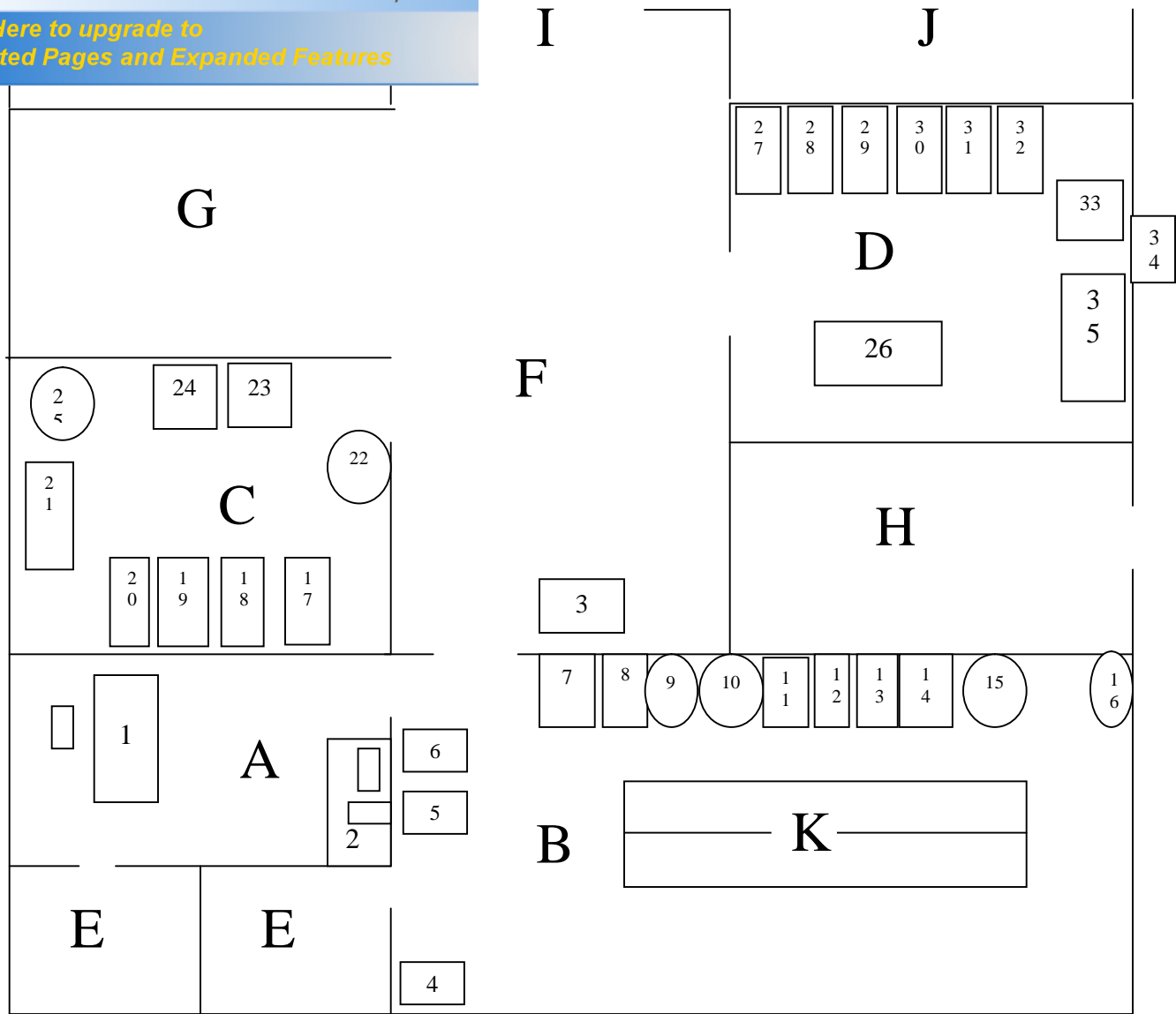
## hs of ISO 9001:2008 Audit



Opening Meeting of ISO audit (18-5-11)



Closing Meeting of ISO audit (18-5-11)



## LEGENDS

1	Table of Lab Incharge
2	Computer Table
3	Display Board
4	Fume Cupboard
5	BOB Incubator (BTI)
6	Deep Freezer
7	Refrigerator
8	Hot Air Oven
9	Desiccator
10	Desiccator
11	Hot Plate
12	Muffle Furnace
13	Rotary Shaker
14	Water Bath General Purpose
15	Bi distillation Unit
16	Single distillation Unit
17	Tissue Grinder
18	Centrifuge
19	Water Bath Bacteriological
20	Vacuum Pimp
21	Table Bacteriological Medias
22	Gas Cylinder
23	Bacteriological Incubator
24	BOD Incubator (Labin)
25	Autoclave
26	Table for Chemist
27	Balance Mechanical
28	Balance Electronics
29	pH meter
30	EC meter
31	Turbidity meter
32	Flame photometer
33	ION meter
34	AC
35	Spectrophotometer
A	Office of Lab Incharge
B	Wet Lab
C	Bacteriological Lab
D	Instrument Lab
E	Toilet
F	Hall
G	Staircase & Cooling water machine
H	Electric Room
I	Main Entrance Gate
J	Parking of Four whler
K	Analysis Table

LAYOUT OF WATER QUALITY LABORATORY LEVEL - II , NAGPUR