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GOVERNMENT OF MAHARASHTRA WATER RESOURCES DEPARTMENT

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



WATER QUALITY LAB LEVEL-II, NAGPUR

ANNUAL REPORT YEAR 2014-2015

Executive Engineer Hydrology Project Division, Nagpur



PREFACE

Click Here to upgrade to Unlimited Pages and Expanded Features 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 2014 to May 2015 by the agency M/s. KNK Associates Nagpur. as awarded a contract towards % Rroviding Trained and experienced personnel to Operate & Maintained the Water Quality Lab Level-II, Nagpur as per prescribed procedures for the month June-2012 to May-2015+. 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.

> **(J.D.Tale)** Executive Engineer Hydrology Project Division Nagpur. (Maharashtra)





PDF Complete. nual Report

Features ring through Water Quality Lab Level-II Nagpur for the Year 2014- 2015

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CHAPTER – I EXECUTIVE SUMMARY



CHAPTER-1

ECUTIVE SUMMARY

Annual Report On Water Quality Monitoring through Water Quality Lab Level-II, Nagpur for the Year 2014-2015

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 % Inform 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 2014-2015. 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 2014-2015 are considered.



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lim	ited Page	es and Expande	d Features	le	Baseline	e Sample	Dam (Res Sam	servoir) ple	
	Sr. No.	Year	First Round	Second Round	First Round	Second Round	First Round	Second Round	Total
	1	2014-2015	8	86	8	40	4	48	194
		Total	Samples	analyzed d	luring repo	orting peric	od 194 N	os.	

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.



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esults and Observations 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 is found more than 4 mg/L during Monsoon. It shows A higher degree of organic pollution is observed at station Wadsa with respect to other Locations and is evidenced by the indicated values of BOD. Concentration of Colliform bacteria is high in all seasons at three Locations , Deori, Kardha and Wadsa it makes the water unsafe for drinking purpose. The DO Values at all stations lies above 6 mg/L. The Alkalinity of All Location are below 200 mg/L.

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 and SoitDindora are found to be more than 3 mg/L during all Summer 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. 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: 2012) 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 Dhaba and SoitDhaba.



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River Kanhan

Mathani. The water quality data reveals that the quality of the water of the River is deteriorating at station Mathani. The colliform bacteria in the water are found in high concentration compared to the specified limits at all stations. 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 BOD Crosses 3 mg/l in Monsoon and in Summer.

River Penganga

The Water Quality of the River Penganga is Monitored at Two 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. And BOD Crosses 3 mg/l suring summer. Colliform bacterial density is higher than the specified standard during all seasons and during Monsoon Coliform shows higher values at kolgaon compared to Saiphal.. 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.

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 Kawatha which is indicated by high values of BOD and COD. The bacterial density found higher at Taklikhetri compared to Kawatha is high enough to make unsafe for drinking purpose without any conventional treatment.



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River Chandrabhaga

The water quanty or 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 i.e. BOD above 4 mg/l and COD above 15 mg/l. 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; The very low DO 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 Total coliform and Faecal Coliform 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 Five Reservoirs (Dams) namely Pench, Upperwardha, Katepurna, Chapdoh and Gosikhurd which are used as a source of drinking water is monitored by the water quality Lab Level-II, Nagpur. Gosikhurd Reservoir is new site collected from February-2015. The BOD of all Reservoirs is slightly above the specified limit of 2 mg/L, and at katepurna it is found slightly higher than 4.0 mg/I. Higher values are obtained during Monsoon and Summer and may be due to the increase in floral activities. Colliform bacteria are found to be crossing the limit of IS 10500 for drinking water at all stations but it is drastic higher in Monsoon.Specially for Chapdoh Dam.



1.6 Conclusion

served that, these rivers are polluted to varying extent. 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.
- Educating people about the importance of conservation and restoration of existing sources of water.
- Water quality Annual Report shall be publicly published every year.



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CHAPTER – II INTRODUCTION



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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 tributeries 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 5 Stations on various rivers flowing through Vidarbha. Also the water quality of 5 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 4 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 cant. Frequency of Sampling is generally one Sample in

three months.

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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 9 Trend stations. List is given in

Table 2.

Sr. No.	Major Basin	Independent River	Tributary	Sub-Tributary
			Wainganga	Pench
			wanganga	Kanhan
			Wardha	
1.	Godavari	Godavari	Penganga	Pus
			Indravati	Bandiya
			Pranhita	
0			D	Mun
2.	Гарі	Гарі	Purna	Vvan Chandrabhaga

Table 1: Details of the Basin

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Table 2:

ler Jurisdiction of Water Quality Lab level-II, Nagpur

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Unlimited Pag	es and E	xpanded Features	DISTRICT	TAHASIL	NAME OF RIVER	
	NO.	STATION	Baseline Stat	tions		
	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	Saiphal	Yeotmal	Ghatanji	Penganga	
	12	Khariya	Amravati	Dharni	Тарі	
	13	Mahagaon	Gadchiroli	Ettapalli	Pranhita	
			Trend Stations			
	14.	Dhaba	Chandrapur	Gondpipri	Wardha	
	15.	WarudBagaji	Amravati	Tiwasa	Wardha	
	16.	Anantwadi	Yeotmal	Mahagaon	Pus	
	17.	Kolgaon	Yeotmal	Wuni	Penganga	
	18.	Soitdindora	Chandrapur	Warora	Wardha	
	19.	Warkhed	Akola	Telhara	Wan	
	20.	Daryapur	Amravati	Daryapur	Chandrabhaga	
	21.	Kawatha	Akola	Balapur	Mun	
	22.	TakliKhetri	Akola	Patur	Mun	
			Reservoir	S		
	23.	Katepurna	Akola	Barshitakli	Katepurna	
	24.	Upper Wardha	Amravati	Morshi	Wardha	
	25.	Pench	Nagpur	Parshioni	Pench	
	26	Chapdoh	Yevatmal	Arni	Waghadi	
	27	Gosikhurd	Bhandara	Pauni	Wainganga	



<u>1 of Water Quality Lab Level-II, Nagpur</u>

in Analytical Quality Control Exercises

1) <u>Within Lab AQC:</u>

Within Lab AQC conducted in December – 2014.

Samples (Sample A and Sample B) are analysed during the period 01-12-2014 to 28-12-2014.

The overall performance of the Lab stands 100%.

2) Inter Lab AQC:

i) 31st Proficiency Testing (AQC / Water Exercise) conducted by CPCB in January-2015.

Samples received on dated 13-01-2015. Samples analysed during the period 13-01-2015 to 23-01-2015. And the Performance Report received in April-2015. The overall performance of the Lab stands **100 %**.

3) Intra Lab AQC:

Not conducted in this period



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Annual Report for the Period of 2014-2015

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:-26

2) Monthly sample collection: - 27 samples / 14 Samples.

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

Baseline Samples : Once in Three Months

am samples : Monthly

4) Govt. staff related to Laboratory: -

- 1. Mr.J.D.Tale., Executive Engineer
- 2. Mr.A.K.Hinge, AE-I.
- 3. Mr. M.M.Dange (AE-II. & Govt. Analyst)

5) Lab operating Agency: - KNK Associates, Nagpur.

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

2. Miss. Jayashree W. Raut (Analyst)

3. Miss. Renuka J. Thakre (Analyst)

4. Mr. Gaurav S. Ghayer (Lab. Assistant)

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

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



ntenance of water Quality Laboratory Level-II, Nagpur

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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: 1 No.
 - 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.





ocation covered under the jurisdiction of

uality Lab Level-II, Nagpur

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Sr. No.	Name of Station	Name of River	Frequency of sampling	No. Of Samples in 2014-2015
	B	aseline Samples		
1	Deori	Wainganga	Once in three months	4
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	4
10	Drugwada	Wardha	Once in three months	4
11	Saiphal	Penganga	Once in three months	4
12	Khariya	Тарі	Once in three months	4
13	Mahagaon	Pranhita	Once in three months	4



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	COII	ipicic PDFC	omplete.	fDivor	Frequency of	No. Of Samples in
lick Inlim	Here to ited Pag	upgrade to res and Expanded Featur	es	n River	sampling	2014-2015
		Tı	end Sam	nples		
	14.	Dhaba	Wardha		Monthly	12
	15.	WarudBagaji	Wardha		Monthly	12
	16.	Anantwadi	Pus		Monthly	9
	17.	Kolgaon	Pengan	ga	Monthly	12
	18.	Soitdindora	Wardha		Monthly	12
	19.	Warkhed	Wan		Monthly	8
	20.	Daryapur	Chandra	abhaga	Monthly	8
	21.	Kawatha	Mun		Monthly	9
	22.	TakliKhetri	Mun		Monthly	8
			Reserv	voir Samp	les	
	23.	Katepurna	Katepur	na	Monthly	12
	24.	Upper Wardha	Wardha		Monthly	12
	25.	Pench	Pench		Monthly	12
	26	Chapdoh	Waghac	li	Monthly	12
	27	Gosikhurd	Wainga	nga	Monthly	4

<u>Total No. of Samples collected and analyzed during Reported Period</u> (June-2014 to May-2015) – 194 Nos.



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

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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	рН	рН
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	NH3-N	NH3-N
12	NO2	NO2
13	NO3	NO3
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	СО3, НСО3	СОЗ, НСОЗ
26	Total Colliforms	Total coliforms
27	Fecal coliforms	Feacal Colliforms
28	Fluoride	
29	Boron	



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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	рН	рН
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	NO2
11	NH3-N	NO3
12	NO2	Total Phosphorus
13	NO3	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	Feacal Colliforms
24 & 25	СО3, НСО3	СОЗ, НСОЗ
26	Total Colliforms	
27	Fecal coliforms	
28	Fluoride	
29	Boron	



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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	рН	рН
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	NO2
11	NH3-N	NO3
12	NO2	Total Phosphorus
13	NO3	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	Feacal Colliforms
24 & 25	СОЗ, НСОЗ	СО3, НСО3
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 METHODOLOGÝ



CHAPTER-3

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 crisscrossed 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 % Inform 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:

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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 ,21st Ed, 2005 as a standard procedures for analysis of 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

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Sample Collection from Party/Person

Sample forms fill up and issuing receipt of cash received.

Inward the Sample, Giving the Sr. No. to the sample noted into sample entry register

Sample Analysis as per the customeros requirement

Observations & calculations of all Analyzed Parameters

The results of parameters are checked & prepared

Issue of Final Result to Customer



of Water Quality samples the following parameters zed during the Period 2014-2015

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ers and the methodology used for the analysis.

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



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



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CHAPTER – IV RESULT & OBSERVATIONS



CHAPTER - 4 TS AND OBSERVATIONS

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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 2014-2015 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.



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	Station: Deori						
				Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer		
			Mean	Mean	Mean		
1	рН	-	8.2	8.3	8.2		
2	EC	µmhos/cm	356.5	416.0	391.0		
3	DO	mg/L	6.5	6.5	6.4		
4	BOD	mg/L	3.6	3.2	3.2		
5	COD	mg/L	13.5	10.0	12.0		
6	TDS	mg/L	213.0	242.0	242.0		
7	Alkalinity	mg/L as CaCO3	176.0	184.0	164.0		
8	Chloride	mg/L	20.0	24.0	38.0		
9	Calcium (as Ca)	mg/L	37.6	41.6	37.6		
10	Magnesium (as Mg)	mg/L	18.5	16.5	14.1		
11	Total colliforms	MPN/100 ml	735.0	21.0	7.0		
12	Faecal colliforms	MPN/100 ml	176.0	4.0	0.0		
		Station: K	ardha				
				Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer		
			Mean	Mean	Mean		
1	рН	-	8.3	8.4	8.3		
2	EC	µmhos/cm	316.0	392.0	372.0		
3	DO	mg/L	6.5	6.3	6.0		
4	BOD	mg/L	3.5	3.3	3.4		
5	COD	mg/L	13.0	12.0	13.0		
6	TDS	mg/L	194.0	244.0	230.0		
7	Alkalinity	mg/L as CaCO3	166.0	176.0	156.0		
8	Chloride	mg/L	22.0	28.0	32.0		
9	Calcium (as Ca)	mg/L	37.2	39.2	29.6		
10	Magnesium (as Mg)	mg/L	13.9	17.0	15.6		
11	Total colliforms	MPN/100 ml	660.0	0.0	11.0		

₹ Cor	DF	Your complimenta use period has ende Thank you for usin	ry d. ng					
	npio	PDF Complet	C. Station: Wad	Station: Wadsachinch				
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	No.	rarameter	Unit	Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.3	8.3	8.4		
	2	EC	µmhos/cm	299.0	350.0	336.0		
	3	DO	mg/L	6.0	6.8	6.3		
	4	BOD	mg/L	4.1	2.4	3.2		
	5	СОД	mg/L	14.0	6.0	10.0		
	6	TDS	mg/L	187.0	206.0	204.0		
	7	Alkalinity	mg/L as CaCO3	158.0	156.0	148.0		
	8	Chloride	mg/L	13.5	21.0	24.0		
	9	Calcium (as Ca)	mg/L	36.4	35.2	29.6		
	10	Magnesium (as Mg)	mg/L	12.6	13.1	15.1		
	11	Total colliforms	MPN/100 ml	369.5	70.0	40.0		
	12	Faecal colliforms	MPN/100 ml	110.5	17.0	17.0		
			Station: Wag	Station: WagholiButti				
			Unit	Season				
	Sr. No.	Parameter		Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.3	8.4	8.5		
	2	EC	µmhos/cm	279.5	318.0	312.0		
	3	DO	mg/L	6.2	6.5	6.1		
	4	BOD	mg/L	4.0	2.6	3.5		
	5	COD	mg/L	14.0	8.0	12.0		
	6	TDS	mg/L	179.0	182.0	194.0		
	7	Alkalinity	mg/L as CaCO3	160.0	136.0	144.0		
	8	Chloride	mg/L	15.5	19.0	22.0		
	9	Calcium (as Ca)	mg/L	32.4	38.4	27.2		
	10	Magnesium (as Mg)	mg/L	15.3	11.2	15.6		
	11	Total colliforms	MPN/100 ml	206.0	26.0	22.0		
	12	Faecal colliforms	MPN/100 ml	72.5	8.0	5.0		

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				Season						
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer				
				Mean	Mean	Mean				
	1	рН	-	8.3	8.2	8.2				
	2	EC	µmhos/cm	347.0	570.0	410.0				
	3	DO	mg/L	5.9	6.8	6.0				
	4	BOD	mg/L	3.6	2.8	4.0				
	5	COD	mg/L	12.0	9.0	14.0				
	6	TDS	mg/L	205.0	336.0	248.0				
	7	Alkalinity	mg/L as CaCO3	158.0	240.0	192.0				
	8	Chloride	mg/L	22.0	34.0	24.0				
	9	Calcium (as Ca)	mg/L	33.6	56.0	36.8				
	10	Magnesium (as Mg)	mg/L	13.4	27.2	18.5				
	11	Total colliforms	MPN/100 ml	363.0	4.0	34.0				
	12	Faecal colliforms	MPN/100 ml	114.0	0.0	11.0				
		Station: Mathani								
				Season						
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer				
				Mean	Mean	Mean				
	1	рН	-	8.2	8.4	8.5				
	2	EC	µmhos/cm	405.0	511.0	456.0				
	3	DO	mg/L	6.7	6.6	5.6				
	4	BOD	mg/L	3.5	2.9	4.4				
	5	COD	mg/L	12.5	9.0	16.0				
	6	TDS	mg/L	249.0	314.0	272.0				
	7	Alkalinity	mg/L as CaCO3	206.0	232.0	208.0				
	8	Chloride	mg/L	30.0	36.0	37.0				
	9	Calcium (as Ca)	mg/L	48.8	62.4	42.4				
	10	Magnesium (as Mg)	mg/L	18.2	21.4	16.0				
	11	Total colliforms	MPN/100 ml	256.5	0.0	13.0				
	12	Faecal colliforms	MPN/100 ml	89.0	0.0	5.0				

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001	PDF Complete.		RIVER FOR K	RIVER FOR KAMPTIKHAIRI FOR 2014-2015				
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				Season				
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.3	8.4	8.1		
	2	EC	µmhos/cm	433.0	521.0	438.0		
	3	DO	mg/L	6.2	6.4	5.8		
	4	BOD	mg/L	3.7	3.2	4.2		
	5	COD	mg/L	13.0	14.0	16.0		
	6	TDS	mg/L	268.0	308.0	266.0		
	7	Alkalinity	mg/L as CaCO3	200.0	224.0	220.0		
	8	Chloride	mg/L	25.5	32.0	30.0		
	9	Calcium (as Ca)	mg/L	45.2	53.6	43.2		
	10	Magnesium (as Mg)	mg/L	15.8	19.9	18.0		
	11	Total colliforms	MPN/100 ml	605.5	7.0	22.0		
	12	Faecal colliforms	MPN/100 ml	132.5	0.0	7.0		
		DATA ABS	STRACT FOR RIVE	R WAN FOR 2014	-2015			
			Station: Wa	Station: Warkhed				
				Season				
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.4	8.3			
	2	EC	µmhos/cm	373.0	440.2			
	3	DO	mg/L	6.3	6.6			
	4	BOD	mg/L	3.8	3.4			
	5	COD	mg/L	12.3	12.0			
	6	TDS	mg/L	218.0	266.0			
	7	Alkalinity	mg/L as CaCO3	173.3	208.8			
	8	Chloride	mg/L	28.0	30.2			
	9	Calcium (as Ca)	mg/L	44.0	51.4			
	10	Magnesium (as Mg)	mg/L	15.2	21.4			
	11	Total colliforms	MPN/100 ml	1576.7	36.8			
	12	Faecal colliforms	MPN/100 ml	533.3	12.8			

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Graph Showing Variation in EC for the year 2014-2015



Graph Showing Variation in Dissolved Oxygen for the year 2014-2015




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tion in Alkalinity for the year 2014-2015

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240.0 200.0 160.0 120.0 40.0 0.0 Deori Kardha WadsaChinchWagholiButti Temburdoh Mathani Kamptikhairi Warkhed Monsoon Winter Summer BIS (IS 10500) desirable

Graph Showing Variation in Calcium as Ca for the year 2014-2015





in Magnesium as Mg for the year 2014-2015

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Graph Showing Variation in Faecal Colliforms for the year 2014-2015





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11

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Calcium (as Ca)

Total colliforms

Faecal colliforms

Magnesium (as Mg)

ACT FOR RIVER MUN FOR 2014-2015

		Station: Ka	watha		
				Season	
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
			Mean	Mean	Mean
1	рН	-	8.3	8.3	8.4
2	EC	µmhos/cm	366.3	430.4	513.0
3	DO	mg/L	6.5	6.8	4.8
4	BOD	mg/L	3.8	3.3	5.0
5	COD	mg/L	14.0	10.8	18.0
6	TDS	mg/L	222.7	259.2	322.0
7	Alkalinity	mg/L as CaCO3	177.3	209.6	228.0
8	Chloride	mg/L	28.0	27.8	38.0
9	Calcium (as Ca)	mg/L	45.6	49.6	56.8
10	Magnesium (as Mg)	mg/L	16.0	18.5	18.0
11	Total colliforms	MPN/100 ml	1230.0	44.0	34.0
12	Faecal colliforms	MPN/100 ml	393.3	13.6	7.0
		Station: Tak	likhetri	I	I
				Season	
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
			Mean	Mean	Mean
1	рН	-	8.3	8.4	
2	EC	µmhos/cm	451.7	502.8	
3	DO	mg/L	6.2	6.7	
4	BOD	mg/L	4.0	3.2	
5	COD	mg/L	13.3	11.2	
6	TDS	mg/L	272.0	301.2	
7	Alkalinity	mg/L as CaCO3	206.7	228.8	
8	Chloride	mg/L	32.7	35.0	

49.9

19.4

1953.3

759.3

54.7

22.6

51.8

14.4

mg/L

mg/L

MPN/100 ml

MPN/100 ml

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	Sr.	Parameter	Unit	Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.4	8.3			
	2	EC	µmhos/cm	521.0	556.8			
	3	DO	mg/L	5.9	5.8			
	4	BOD	mg/L	3.9	4.6			
	5	COD	mg/L	14.0	15.2			
	6	TDS	mg/L	312.0	331.2			
	7	Alkalinity	mg/L as CaCO3	225.3	235.2			
	8	Chloride	mg/L	48.7	46.2			
	9	Calcium (as Ca)	mg/L	52.0	56.5			
	10	Magnesium (as Mg)	mg/L	24.6	21.2			
	11	Total colliforms	MPN/100 ml	1200.0	52.2			
	12	Faecal colliforms	MPN/100 ml	350.0	18.6			
		DATA AB	STRACT FOR RIVE	R TAPI FOR 201	4-2015			
			Station: Kharia					
				Season				
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer		
				Mean	Mean	Mean		
	1	рН	-	8.3	8.2	8.1		
	2	EC	µmhos/cm	567.5	573.0	760.0		
	3	DO	mg/L	6.0	5.8	5.8		
	4	BOD	mg/L	4.3	4.0	4.0		
	5	COD	mg/L	15.0	16.0	14.0		
	6	TDS	mg/L	335.0	338.0	442.0		
	7	Alkalinity	mg/L as CaCO3	276.0	252.0	332.0		
	8	Chloride	mg/L	34.0	42.0	54.0		
	9	Calcium (as Ca)	mg/L	56.4	57.6	60.0		
	10	Magnesium (as Mg)	mg/L	26.5	22.4	31.6		
	11	Total colliforms	MPN/100 ml	885.0	21.0	22.0		
	12	Faecal colliforms	MPN/100 ml	261.5	7.0	5.0		

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gico un			Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer	
			Mean	Mean	Mean	
1	рН	-	8.1	8.3	8.3	
2	EC	µmhos/cm	373.5	522.2	479.0	
3	DO	mg/L	6.2	6.6	5.6	
4	BOD	mg/L	3.4	3.3	4.2	
5	COD	mg/L	12.3	11.6	15.7	
6	TDS	mg/L	229.0	314.8	290.7	
7	Alkalinity	mg/L as CaCO3	196.0	244.8	208.0	
8	Chloride	mg/L	24.5	39.6	40.0	
9	Calcium (as Ca)	mg/L	45.0	59.0	48.0	
10	Magnesium (as Mg)	mg/L	16.9	20.9	19.9	
11	Total colliforms	MPN/100 ml	1015.0	46.0	17.3	
12	Faecal colliforms	MPN/100 ml	334.5	14.4	3.7	
		Station: Sa	aiphal			

Station: Saiphal

			Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer	
			Mean	Mean	Mean	
1	рН	-	8.5	8.4	8.5	
2	EC	µmhos/cm	342.5	581.0	440.0	
3	DO	mg/L	6.2	6.3	6.0	
4	BOD	mg/L	3.6	3.0	3.8	
5	COD	mg/L	13.0	9.0	13.0	
6	TDS	mg/L	205.0	346.0	258.0	
7	Alkalinity	mg/L as CaCO3	162.0	236.0	180.0	
8	Chloride	mg/L	24.0	42.0	40.0	
9	Calcium (as Ca)	mg/L	43.6	60.0	38.4	
10	Magnesium (as Mg)	mg/L	14.3	17.0	17.0	
11	Total colliforms	MPN/100 ml	435.0	46.0	7.0	
12	Faecal colliforms	MPN/100 ml	150.0	14.0	0.0	

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Graph Showing Variation in EC for the year 2014-2015





Graph Showing Variation in Dissolved Oxygen for the year 2014-2015



20.0 18.0 16.0 14.0 (**1**2.0 10.0 8.0 6.0 4.0 4.0 2.0 0.0 Kawatha Taklikhetri Kharia Kolgaon Saiphal Daryapur Monsoon Winter ■ Summer



Graph Showing Variation in TDS for the year 2014-2015





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Summer

Monsoon

Winter



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in Magnesium as Mg for the year 2014-2015



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Graph Showing Variation in Total Colliforms for the year 2014-2015

Graph Showing Variation in Faecal Colliforms for the year 2014-2015



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	51. No.	Parameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.3	8.5	8.5
	2	EC	µmhos/cm	555.0	363.0	502.0
	3	DO	mg/L	6.6	7.1	6.2
	4	BOD	mg/L	3.7	2.4	3.8
	5	COD	mg/L	12.0	8.0	12.0
	6	TDS	mg/L	331.0	226.0	306.0
	7	Alkalinity	mg/L as CaCO3	248.0	176.0	244.0
-	8	Chloride	mg/L	37.0	18.0	39.0
	9	Calcium (as Ca)	mg/L	60.0	43.2	52.8
	10	Magnesium (as Mg)	mg/L	19.4	17.5	22.4
	11	Total colliforms	MPN/100 ml	335.0	17.0	17.0
	12	Faecal colliforms	MPN/100 ml	93.5	2.0	0.0
			Station: War	udBagaji		
				Season		
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.2	8.3	8.2
	2	EC	µmhos/cm	527.3	468.2	565.7
F	3	DO	mg/L	6.5	6.7	5.7
	4	BOD	mg/L	3.9	3.2	4.2
	5	COD	mg/L	14.3	10.6	14.7
F	6	TDS	mg/L	318.0	284.0	329.3
F	7	Alkalinity	mg/L as CaCO3	246.0	224.0	249.3
	8	Chloride	mg/L	40.3	34.0	36.7
F	9	Calcium (as Ca)	mg/L	54.4	43.7	54.9
F	10	Magnesium (as Mg)	mg/L	24.4	22.2	23.0
-	11	Total colliforms	MPN/100 ml	889.8	30.6	1.7
F	12	Faecal colliforms	MPN/100 ml	283.0	8.6	0.0

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	No.	Farameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.2	8.4	8.5
	2	EC	µmhos/cm	477.3	474.8	442.7
	3	DO	mg/L	6.3	6.6	5.9
	4	BOD	mg/L	3.7	3.4	3.8
	5	СОД	mg/L	13.8	11.8	13.7
	6	TDS	mg/L	286.5	287.2	270.0
	7	Alkalinity	mg/L as CaCO3	236.5	231.2	194.7
	8	Chloride	mg/L	27.8	31.2	36.0
	9	Calcium (as Ca)	mg/L	57.4	54.7	41.3
	10	Magnesium (as Mg)	mg/L	19.6	21.1	19.6
	11	Total colliforms	MPN/100 ml	1176.0	61.8	14.0
	12	Faecal colliforms	MPN/100 ml	324.8	18.2	2.7
			Station: D	haba		
					Season	
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.3	8.4	8.4
	2	EC	µmhos/cm	582.0	533.6	638.7
	3	DO	mg/L	6.0	6.4	5.4
	4	BOD	mg/L	3.7	3.5	4.6
	5	COD	mg/L	14.0	12.2	17.7
	6	TDS	mg/L	348.5	324.8	381.3
	7	Alkalinity	mg/L as CaCO3	247.0	242.4	252.0
	8	Chloride	mg/L	47.0	40.4	52.7
	9	Calcium (as Ca)	mg/L	54.2	59.8	59.2
	10	Magnesium (as Mg)	mg/L	23.1	21.2	21.2
	11	Total colliforms	MPN/100 ml	515.5	47.6	16.0
	12	Faecal colliforms	MPN/100 ml	172.8	15.0	3.3



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upgrade to nes and Expanded Features		Station: Ana	Station: Anantwadi					
			Season					
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer			
			Mean	Mean	Mean			
1	рН	-	8.4	8.4	8.6			
2	EC	µmhos/cm	454.0	472.0	551.0			
3	DO	mg/L	6.8	6.5	5.4			
4	BOD	mg/L	3.4	3.4	4.6			
5	СОД	mg/L	12.7	11.6	15.0			
6	TDS	mg/L	276.7	284.4	320.0			
7	Alkalinity	mg/L as CaCO3	202.7	219.2	256.0			
8	Chloride	mg/L	36.7	32.8	52.0			
9	Calcium (as Ca)	mg/L	52.0	51.7	64.0			
10	Magnesium (as Mg)	mg/L	17.0	23.9	17.5			
11	Total colliforms	MPN/100 ml	2240.0	41.4	0.0			
12	Faecal colliforms	MPN/100 ml	713.3	12.8	0.0			

DATA ABSTRACT FOR RIVER PRANHITA FOR 2014-2015

Station:	Mahagaon
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			Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer	
			Mean	Mean	Mean	
1	рН	-	8.1	8.4	8.5	
2	EC	µmhos/cm	305.5	431.0	415.0	
3	DO	mg/L	6.0	6.2	6.2	
4	BOD	mg/L	4.6	3.5	3.6	
5	СОД	mg/L	18.5	14.0	14.0	
6	TDS	mg/L	192.0	258.0	240.0	
7	Alkalinity	mg/L as CaCO3	166.0	216.0	172.0	
8	Chloride	mg/L	19.0	32.0	34.0	
9	Calcium (as Ca)	mg/L	40.8	53.6	35.2	
10	Magnesium (as Mg)	mg/L	12.2	18.0	19.0	
11	Total colliforms	MPN/100 ml	210.5	0.0	14.0	
12	Faecal colliforms	MPN/100 ml	69.0	0.0	0.0	

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	inpio	PDF Complet	FOR RIVER IN	NDRAVATI FOR 2	014-2015	
Click Here to Unlimited Pa	upgra des an	de to d Expanded Features	Station: Dar	nrencha		
				Season		
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.3	8.1	8.4
	2	EC	µmhos/cm	177.0	143.0	302.0
	3	DO	mg/L	6.4	7.1	6.2
	4	BOD	mg/L	3.9	2.2	3.0
	5	COD	mg/L	14.5	9.0	9.0
	6	TDS	mg/L	107.0	86.0	180.0
	7	Alkalinity	mg/L as CaCO3	84.0	80.0	152.0
	8	Chloride	mg/L	10.0	8.0	22.0
	9	Calcium (as Ca)	mg/L	20.8	15.2	32.0
	10	Magnesium (as Mg)	mg/L	5.3	8.3	14.6
	11	Total colliforms	MPN/100 ml	300.0	11.0	5.0
	12	Faecal colliforms	MPN/100 ml	108.0	2.0	0.0
		DATA ABS	TRACT FOR RIVER	BANDIA FOR 20	14-2015	
			Station: I	Petta		
				Season		
	Sr. No.	Parameter	Unit	Monsoon	Winter	Summer
				Mean	Mean	Mean
	1	рН	-	8.2	8.1	8.0
	2	EC	µmhos/cm	193.5	122.0	135.0
	3	DO	mg/L	6.6	7.0	6.0
	4	BOD	mg/L	3.5	2.3	3.2
	5	COD	mg/L	11.0	8.0	10.0
	6	TDS	mg/L	119.0	74.0	86.0
	7	Alkalinity	mg/L as CaCO3	92.0	68.0	72.0
	8	Chloride	mg/L	11.5	7.0	8.0
	9	Calcium (as Ca)	mg/L	22.4	12.8	19.2
	10	Magnesium (as Mg)	mg/L	6.1	6.3	3.9
	11	Total colliforms	MPN/100 ml	250.0	7.0	0.0
	12	Faecal colliforms	MPN/100 ml	79.5	0.0	0.0

ariation in pH for the year 2014-2015

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Graph Showing Variation in Dissolved Oxygen for the year 2014-2015





Graph Showing Variation in TDS for the year 2014-2015



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Graph Showing Variation in Calcium as Ca for the year 2014-2015 80.0 70.0 Calcium as Ca mg/L 60.0 50.0 40.0 30.0 20.0 10.0 0.0 Drugwada Warudbagaji SoitDindora Dhaba Anantwadi Mahagaon Damrencha Petta Monsoon Winter Summer BIS (IS 10500) desirable



in Magnesium as Mg for the year 2014-2015

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upgra	de to Id Expanded Features	Station: P	Station: PENCH					
ges and Expanded reatures			Season					
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer			
			Mean	Mean	Mean			
1	рН	-	8.3	8.4	8.4			
2	EC	µmhos/cm	398.3	410.0	375.0			
3	DO	mg/L	6.5	6.7	5.9			
4	BOD	mg/L	3.7	3.1	3.4			
5	COD	mg/L	12.8	10.6	12.7			
6	TDS	mg/L	242.5	248.0	232.0			
7	Alkalinity	mg/L as CaCO3	208.0	215.2	193.3			
8	Chloride	mg/L	21.5	23.4	20.7			
9	Calcium (as Ca)	mg/L	47.8	49.6	43.7			
10	Magnesium (as Mg)	mg/L	15.6	20.5	17.5			
11	Total colliforms	MPN/100 ml	384.0	35.0	5.3			
12	Faecal colliforms	MPN/100 ml	104.3	8.2	0.0			
		Station: KAT	EPURNA					

			Season			
Sr. No.	Parameter	Unit	Monsoon	Winter	Summer	
			Mean	Mean	Mean	
1	рН	-	8.4	8.4	8.4	
2	EC	µmhos/cm	574.8	561.2	612.3	
3	DO	mg/L	6.5	6.6	5.7	
4	BOD	mg/L	4.0	3.5	4.4	
5	COD	mg/L	14.5	11.2	16.3	
6	TDS	mg/L	342.0	338.8	361.3	
7	Alkalinity	mg/L as CaCO3	237.0	248.0	230.7	
8	Chloride	mg/L	49.0	43.6	58.7	
9	Calcium (as Ca)	mg/L	56.2	58.2	56.5	
10	Magnesium (as Mg)	mg/L	18.3	22.3	20.7	
11	Total colliforms	MPN/100 ml	567.3	32.4	23.7	
12	Faecal colliforms	MPN/100 ml	216.5	13.2	8.0	

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	Sr. No.		Parameter	Unit	Monsoon	Winter	Summer
					Mean	Mean	Mean
	1	pН		-	8.3	8.3	8.4
	2	EC		µmhos/cm	522.3	482.8	480.7
	3	DO		mg/L	6.5	6.4	5.8
	4	BOD		mg/L	3.8	3.6	4.2
	5	COD		mg/L	13.8	12.4	16.0
	6	TDS		mg/L	316.0	290.4	285.3
	7	Alkal	inity	mg/L as CaCO3	231.0	221.6	206.7
	8	Chlor	ide	mg/L	42.0	38.4	34.7
	9	Calciu	ım (as Ca)	mg/L	54.6	50.7	42.7
	10	Magn	esium (as Mg)	mg/L	20.4	22.4	25.6
	11	Total	colliforms	MPN/100 ml	884.8	17.4	16.7
	12	Faeca	l colliforms	MPN/100 ml	290.3	6.6	6.3
				Station: UPPE	RWARDHA		
						Season	
	Sr.		Darameter	Unit	Monsoon	Winter	Summer

Sr. No.	Parameter	Unit	Monsoon	Winter	Summer	
			Mean	Mean	Mean	
1	рН	-	8.3	8.3	8.3	
2	EC	µmhos/cm	494.0	444.4	484.0	
3	DO	mg/L	6.4	6.5	5.9	
4	BOD	mg/L	3.8	3.4	3.7	
5	СОД	mg/L	13.3	12.2	13.7	
6	TDS	mg/L	301.0	268.4	296.0	
7	Alkalinity	mg/L as CaCO3	221.0	224.0	221.3	
8	Chloride	mg/L	47.8	34.4	45.7	
9	Calcium (as Ca)	mg/L	55.2	53.3	52.8	
10	Magnesium (as Mg)	mg/L	17.3	23.9	18.5	
11	Total colliforms	MPN/100 ml	256.3	29.4	13.7	
12	Faecal colliforms	MPN/100 ml	85.8	12.4	5.0	

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yes ai				Season	_
No.	Parameter	Unit	Monsoon	Winter	Summer
			Mean	Mean	Mean
1	рН	-		8.4	8.3
2	EC	µmhos/cm		306.0	311.0
3	DO	mg/L		6.2	6.1
4	BOD	mg/L		3.4	3.5
5	СОД	mg/L		13.0	12.3
6	TDS	mg/L		178.0	189.3
7	Alkalinity	mg/L as CaCO3		148.0	152.0
8	Chloride	mg/L		16.0	15.7
9	Calcium (as Ca)	mg/L		29.6	30.7
10	Magnesium (as Mg)	mg/L		11.7	13.8
11	Total colliforms	MPN/100 ml		49.0	8.3
12	Faecal colliforms	MPN/100 ml		22.0	2.3

on: GOSIKHURD RESERVOIR

ariation in pH for the year 2014-2015



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Graph Showing Variation in Dissolved Oxygen for the year 2014-2015





Graph Showing Variation in TDS for the year 2014-2015









Graph Showing Variation in Calcium as Ca for the year 2014-2015



in Magnesium as Mg for the year 2014-2015

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Graph Showing Variation in Total Colliforms for the year 2014-2015



Graph Showing Variation in Faecal Colliforms for the year 2014-2015



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				1	Anantwadi	
				2	Damrencha	
				3	Daryapur	
				4	Deori	
				5	Dhaba	
				6	Drugwada	
				7	Kamptikhairi	
			8	Kardha		
				9	Kawatha	
				10	Kharia	
				11	KolgaonGod	
		Biological Oxygen		12	Mahagaon	
	1	Demand	2 mg/L	13	Mathani	
		(3 days at 27°C)		14	Petta	
		,		15	Saiphal	
				16	SoitDindora	
				17	Taklikhetri	
				18	Temburdoh	
				19	Wadsachinch	
				20	Wagholibutti	
				21	Warkhed	
				22	WardudBagaji	
				23	Chapdoh	
				24	Katepurna	
				25	Pench	
				26	Upperwardha	



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				1	Anantwadi	
				2	Damrencha	
				3	Daryapur	
				4	Deori	
				5	Dhaba	
				6	Drugwada	
				7	Kamptikhairi	
				8	Kardha	
				9	Kawatha	
				10	Kharia	
			11	KolgaonGod		
				12	Mahagaon	
	2	2 Alkalinity	200 ma/L	13	Mathani	
				14	Petta	
				15	Saiphal	
				16	SoitDindora	
				17	Taklikhetri	
				18	Temburdoh	
				19	Wadsachinch	
				20	Wagholibutti	
				21	Warkhed	
				22	WardudBagaji	
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				Sr. No.	Locations	
				1	Anantwadi	
				2	Damrencha	
				3	Daryapur	
				4	Deori	
				5	Dhaba	
				6	Drugwada	
				7	Kamptikhairi	
				8	Kardha	
				9	Kawatha	
				10	Kharia	
				11	KolgaonGod	
				12	Mahagaon	
	3	Total Colliforms	50 MPN/ 100 ml	13	Mathani	
				14	Petta	
				15	Saiphal	
				16	SoitDindora	
				17	Taklikhetri	
				18	Temburdoh	
				19	Wadsachinch	
				20	Wagholibutti	
				21	Warkhed	
				22	WardudBagaji	
				23	Chapdoh	
				24	Katepurna	
				25	Pench	
				26	Upperwardha	



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				Sr. No.	Locations	
				1	Anantwadi	
				2	Damrencha	
				3	Daryapur	
				4	Deori	
				5	Dhaba	
				6	Drugwada	
				7	Kamptikhairi	
				8	Kardha	
				9	Kawatha	
				10	Kharia	
				11	KolgaonGod	
			12	Mahagaon		
	4	Faecal Colliforms	Absent	13	Mathani	
				14	Petta	
				15	Saiphal	
				16	SoitDindora	
				17	Taklikhetri	
				18	Temburdoh	
				19	Wadsachinch	
				20	Wagholibutti	
				21	Warkhed	
				22	WardudBagaji	
				23	Chapdoh	
				24	Katepurna	
				25	Pench	
				26	Upperwardha	



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CHAPTER − V CONCLUSION



CONCLUSION

₹ 2014-2015

Observing all the factors it can be concluded that, Analysis results from all the locations shows increase in value of Biological Oxygen Demand, Total Coliforms & Faecal Coliforms. And some other parameters like Alkalinity also crossing it 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



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to Government of:

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.

6.2 Participation in other activities:





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<u>A N N E X U R E S</u>

Chapter	Particulars	Page No.
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Name of Client

-	
1	V.P.Gharpure, Zilla Parishad, Upper Primary School, Walni, Saoner.
2	Avinash R. Gaurkar, Behind shivaji Mahavidyalaya, Ramnagar-Gadchiroli - 442605
3	Miss. Manjushri R. Nathe, Research Scholar, (Ph.D. in Zoology), Institute of Science, Nagpur.
4	Mr. Mohan D. Patki, Nagpur.
5	Sub Divisional Officer, Z.P. Rural water supply, Sub Division-Nagpur.
6	Miss. Gita Chpram Tichkule, N.H.College - Brahmapuri.
7	M/s, UltraTech Cement Limited, Awarpur Cement Works, Tal:Korpana, Dist:Chandrapur.
8	Mr. Apurv Dahat, Student of M.Sc. Final (Geology), RTM, Nagpur University.
9	Sub Divisional Engineer, Z.P. Rural Water Supply, Sub Division, Nagpur.
10	Mrs. Aruna Sudame, Applied Chemistry, Dept. Raisoni College of Engg, Nagpur.
11	Mr. Yogesh Jichkar, Plot No. 1014, Aashirwad Nagar, Nagpur-440024
12	Miss. R.T.Bidwai, N.H.College - Brahmapuri.
13	National Environmental Engineering Research Institute, Nehru Marg, Nagpur 440020 (INDIA)
14	Uttam value steel Ltd. Wardha
15	Jeevandhara Society of Sisters of St. Joseph, Nagpur, Kingsway, Nagpur.
16	Gopal Muddliar, C/O Madan Udyog (P) Ltd. Above Narayan Bazar, Pratap Nagar Square, Nagpur.
17	Mr. P.R.Satkar, Shri Apartments, Plot No. 131, Old Subhedar Nagar, Nagpur.
18	Mrs. Aruna Sudame, Applied Chemistry, Dept. Raisoni College of Engg, Nagpur.
19	Ekta R. Raut, Assistant Professor, G.H.Raisoni College of Engineering, Nagpur.
20	Chief Officer, Municipal Council, Rajura.
21	V.P.Gharpure, Zilla Parishad, Upper Primary School, Walni, Saoner.
22	Madam Soni Chubey, Jagatpur, Varanasi (U.P)
23	Chief Office, Municipal Council-Warora.
24	Latakisan Construction Pvt. Ltd. Jaganade Square, Nagpur-18.
25	Ku. U.G.Meshram, N.H.College-Brahmapuri
26	V.P.Gharpure, Zilla Parishad, Upper Primary School, Walni, Saoner.
27	Avinash R. Gaurkar, Behind shivaji Mahavidyalaya, Ramnagar-Gadchiroli - 442605
28	Veolia water (India) Pvt. Ltd., 200-A, Shivaji Nagar, Nagpur.
29	Bajaj Steel Industries Limited, C-108, MIDC Industrial area, Hingna Nagpur.
30	Mr. Hemant Kutthe, NCP Crop Science Pvt. Ltd., 297, North Bazar Road, Ram Nagar Square, Nagpur-16



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illimited Pa	iges a	sub Drystonia Onteor, 21 Narai water supply, Sub Division-Nagpur.
	32	Meheruday Gujar, Enviro Analysts & Engineers Pvt. Ltd. Nagpur
	33	Mr. Mohan D. Patki, Nagpur.
	34	Ankit Rajendra Jain, Nagoba Gali No. 1, Chitar Oli, Badkas Chowk, Mahal Nagpur.
	35	Mr. M.B. Khode, Principal, Jawarlal Nehru Jr. College, Wadi- Nagpur-23.
	36	Bharadwaj Ecotech, Nashik
	37	Ku. U.G.Meshram, N.H.College-Brahmapuri
	38	Warden, Priyadarshini Girls Hostel, T-Point Ring Road, Nagpur.
	39	Gramvikas Adhikari, Gat Grampanchayat Kachurvahi (Khodgaon), Panchayat Samiti - Ramtek. Zilla Nagpur.
	40	M/s Krishna Ganga Enviro System Pvt. Ltd., LGF-3, Shree Ganesh Height,Opp. Arun Automobiles, Khamla Square, Ring Road,NAGPUR-15
	41	Rekcon Concrete Pvt.Ltd., Nagpur.
	42	Mr. Nupur Luharia, N.H.College, Brahmapuri.
	43	Nagpur Institute Research Center, Nagpur.
	44	Sub Divisional Soil Survey officer, Soil Survey Sub Division, Nagpur.
	45	Bharadwaj Ecotech, Nashik
	46	Sharad Deorao Shelke, At:-khedi khopdi via kanhan, Taluka:- Mauda. Dist, Nagpur
	47	Mrs. Aruna Sudame, Applied Chemistry, Dept. Raisoni College of Engg, Nagpur.
	48	Meheruday Gujar, Enviro Analysts & Engineers Pvt. Ltd. Nagpur
	49	Sau. Vijayta V. Solanki, Ph. D. Student RTM Nagpur. University.
	50	Miss. Trupti C. Duragkar, Student of Department of Zoology, Institute of Science - Nagpur.
	51	Chairman, Gram Aarogya Poshan va Paani Purvatha va Swachta samiti, Gram Panchayat Gumthada, Panchayat Samiti-Kamptee, Z.P. Nagpur.
	52	Sub Divisional Engineer, Z.P. Rural Water Supply, Sub Division, Saoner.
	53	Sub Divisional Engineer, Rural Water Supply, Sub Division-Parshioni.
	54	Bajaj Steel Industries Ltd. C-108, MIDC Industrial Area Hingna , Nagpur.
	55	Avinash R. Gaurkar, Behind shivaji Mahavidyalaya, Ramnagar-Gadchiroli - 442605
	56	Miss. Nitya Tiwari, Vadamba Village, Jabalpur Road, Maharashtra
	57	Sub Divisional Engineer, Z. P. Rural Water Supply, Sub Division-Mauda. Nagpur.
	58	Ecuminical Sangam, Bramhni, Dist:Nagpur.
	59	A.K.Wankhede, Plot No. 127, Shyam Nagar, Near Manish Nagar, Nagpur.
	60	Sub Divisional, Rural Water Supply, Sub Division-Parshioni, Nagpur.


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	92	Prashant Kolharkar, AFF-2, saketdham, Priyadarshini T-Point, Takli(Sim), Nagpur.
	93	Sub Divisional Engineer, Z.P. Rural water Supply, Sub Division-Mouda, Nagpur.
	94	Chief Officer, Municipal Council-Mul, Dist:Chandrapur.
	95	Chief Officer, Municipal Council-Bramhapuri.
	96	Mr. Vijay Darokar, Chief Chemist, Enviro Analysts & Engineers Private Limited, Nagpur.
	97	Chief Officer, Municipal Council-Kanhan-Pipri.
	98	Miss. Nagma Sayyed, at pt. Tahsil, Sironcha, Dist: Gadchiroli.
	99	Dr. D.P. Singh, Principal, KDK College of Engineering, Nagpur.
	100	Sub Divisional Engineer, Rural Water Supply, Sub Division-Parshioni.
	101	Dr. N.D.Chaudhari, 89-Balasaheb agne laout, Khamla, Nagpur.
	102	Sarpanch, Gram Panchayat, koradi, Panchayat Samiti Kamptee, Dist-Nagpur.
	103	Executive Engineer, MJPWM Division, Nagpur.
	104	Randive Madam, KDKCC College of Engg. Nagpur.
	105	Chief Officer, Municipal Council-Kanhan-Pipri.
	106	Sub Divisional Engineer, Z.P. Rural water supply, Sub Division-Saoner.
	107	Sub Divisional Engineer, Z.P. Rural water supply, Sub Division-Saoner.
	108	M/s Samvid International Pvt. Ltd. 301-302, Tajshree Bussiness Complex, CA Road, Gandhi Putla, Nagpur.
	109	Sub Divisional Engineer, Rural Water Supply, Sub Division-Parshioni.
	110	Gram Panchayat Jakhegaon, Panchayat Samiti-Kamptee, Dist-Nagpur.
	111	Ashtshil Bhambulkar, SCET, Nagpur.
	112	K.R. Pandav Polytechnic College, Nagpur.
	113	Vandana Co-operative housing society, canal Road, Nagpur-10.
	114	Niti Infrastructures Pvt. Ltd., 33-B, Old Rabindra Steel, Hingna MIDC, Nagpur.
	115	Mr. Vishwas Sahasrabhojnee, 71 Shankar Nagar, Nagpur.
	116	Shri guru Harikisan Public School, Benzenbagh, Kadbi Chowk, Nagpur.
	117	Executive Engineer, Water Works, N.M.C. Nagpur.
	118	Mrs. Ragini Khandare, Sarkar Nagar, Bangali Camp, Mul Road, Chandrapur-442401
	119	
	120	



TY LAB, LEVEL – II, NAGPUR 'ROJECT 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 customercs 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 ROJECT 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



LAYOUT OF WATER QUALITY LABORATORY LEVEL - II , NAGPUR

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Electric Room Main Entrance Gate

Analysis Table

Parking of Four whhler