सत्यमेव जयते

जल गुणवत्ता वार्षिकी

WATER QUALITY YEAR BOOK

2015-16

माही, साबरमती, तापी एवं अन्य पश्चिम प्रवाही नदियाँ

Mahi, Sabarmati, Tapi & Other West Flowing Rivers

Central Water Commission

Narmada & Tapi Basin Organization

Hydrological Observation Circle

Gandhinagar

केन्द्रीय जल आयोग

नर्मदा व तापी बेसिन संगठन

जलविज्ञानीय प्रेक्षण परिमंडल

गाँधीनगर

आमुख

पृथ्वी पर प्राकृतिक एवं पर्यावरण संतुलन बनाए रखने हेतु शुद्ध जल एक मूल आवश्यकता है। बढते हुए उद्योगों एवं शहरीकरण से जल गुणवत्ता दिन प्रतिदिन घटती जा रही है। ऐसी स्थिति में शुद्ध जल गुणवत्ता बनाए रखने हेतु प्राकृतिक स्रोत की नियमित जल गुणवत्ता जाँच आवश्यक हो गई है ताकि उद्योगों एवं शहरीकरण पर आवश्यकतानुसार सीमा निर्धारण कर जल की गुणवता को बचाए रखा जा सके।

केन्द्रीय जल आयोग जल संसाधनों के विकास में संलग्न भारत सरकार, जल संसाघन मंत्रालय के अन्तर्गत देश की एक शीर्षस्थ तकनीकी संस्था है, जो जल विज्ञानीय आँकडों के एकत्रीकरण से लेकर परियोजनाओं का मूल्यांकन, अभिकल्पन, प्रबोधन तथा परिचालन करती है।

जल विज्ञानीय प्रेक्षण परिमंडल, गाँधीनगर,नर्मदा तापी बेसिन संगठन के अन्तर्गत केन्द्रीय जल आयोग की एक क्षेत्रीय ईकाई है जिसके अन्तर्गत माही मंडल, गाँधीनगर एवं तापी मंडल, सूरत द्वारा गुजरात, मध्य प्रदेश, राजस्थान, महाराष्ट्र,, दादरा नगर हवेली (केन्द्र शासित प्रदेश) एवं दमन तथा दीव (केन्द्र शासित प्रदेश)से होकर पश्चिम की ओर बहने वाली नदियों पर अधिसूचित महत्वपूर्ण स्थलों पर जल नमूने एकत्रित किए जाते हैं तथा जल गुणवत्ता से संबंधित परीक्षण, फील्ड में तथा उपरोक्त मण्डल कार्यालयों में स्थापित प्रयोगशालाओं में किया जा रहा है। जल नमूने मासिक एंव द्विमासिक आवृति से माह अगस्त **2004** से नियमित रूप से एकत्र किए जा रहे हैं। इसके अतिरिक्त कीटनाशक, अवशेष एवं विषाक्त तत्वों की उपस्थिति के लिये भी विश्लेषण किये जाते है। इसके लिये वर्ष में तीन बार बाढ़काल से पूर्व, बाढ़काल में एवं बाढ़काल के बाद जल नमूने निर्दिष्ट स्थलों से एकत्रित कर के राष्ट्रीय जल गुणवत्ता प्रयोगशाला नई दिल्ली तथा तृतीय स्तर प्रयोगशाला हैदराबाद भेजे जाते हैं। इनका विश्लेषण, भारतीय मानक संस्था द्वारा निर्घारित मानकों के अनुसार किया जाता है।

जल गुणवत्ता के प्रभावी प्रबोधन हेतु, माही, साबरमती, तापी एवं पश्चिम प्रवाही, कुल **11** नदी बेसिनों पर स्थापित कुल **19** जल गुणवत्ता स्थलों (माही मंण्डल की **11** स्थलों एवं तापी मंण्डल की **8** स्थलों) के वर्ष 2015-16 के संकलित आंकडे इस वार्षिकी द्वारा प्रकाशित किए जा रहे हैं। इसके अलावा प्रेक्षण तकनीक, आकलन रीति, जल गुणवत्ता विश्लेषण, जल गुणवत्ता प्रबोधन स्थलों की हिस्ट्री शीट, रासायनिक घटकों का विश्लेषण, विभिन्न उपयोगों हेतु लागू होने वाले विभिन्न गुणवत्ता मानक, आदि का भी इसमें समावेश है।

इस वार्षिकी में दी गयी सूचना एवं संकलित आंकडे, उन सभी के लिये उपयोगी होंगे जो जलगुणवत्ता में रूचि रखते हैं, ऐसी आशा है। इसे और उपयोगी बनाने हेतु सुझाव आमंत्रित हैं।

वार्षिकी में प्रकाशित आंकडों के संकलन, विश्लेषण तथा प्रकाशन हेतु नर्मदा - तापी बेसिन संगठन के अधीनस्थ जल विज्ञानीय प्रेक्षण परिमंडल, गाँधीनगर, माही मंण्डल, गाँधीनगर एवं तापी मंण्डल, सूरत के अधिकारियों एवं कर्मचारियों ने जिस समर्पण एवं लगन से कार्य संपादित किया है, वह प्रशंसनीय है।

सितम्बर **2017**
गाँधीनगर

विमल कुमार
अधीक्षण अभियंता

PREFACE

Water is the life sustaining ingredient on planet Earth. It is also essential for growth and sustenance of flora and fauna, agriculture, industries etc. Growth in its wake brings in pollution. Degradation of water quality is caused not only by increasing inflow of domestic and industrial waste to water streams, but also by excessive drawl of water increasing concentration of pollutants. Therefore, monitoring and control of water quality has become an important aspect of effective management of water resources.

Central Water Commission (CWC) is an apex organization of the country involved in planned development and measurement of water resources sector. CWC has been managing a Hydrological Observation & Flood Forecasting Network, which covers almost all the interstate rivers of India. Water quality assessment is being done by collection of water samples through this vast network.

Hydrological Observation Circle, Gandhinagar, a field unit in Narmada Tapi Basin Organization of the Central Water Commission, is entrusted with the assessment of water quality of west flowing rivers draining through the states of Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Daman & Diu (UT) and DNH (UT). Water samples are collected by two divisions: viz. Mahi and Tapi Divisions, headquartered at Gandhinagar and Surat respectively. Analysis of water samples are done at Field (Level-I) and Divisional (Level-II) Laboratories. These water samples are collected on monthly or bi-monthly basis since August 2004. In addition, the analysis for presence of pesticides, Trace and Toxic elements are also carried out in National River Water Quality Laboratory, New Delhi and level-III laboratory, Hyderabad for which the water samples are collected thrice in a year pre-monsoon, monsoon and post-monsoon.

Water Quality Data Year Book is published as per the guidelines issued under the Hydrology Project. This volume presents water quality data of 19 stations (11 stations under Mahi Division and 8 stations under Tapi Division) on 11 west flowing river basins including the Mahi, Sabarmati and Tapi for the year 2015-16. Short notes on observation technique and estimation procedures, water quality analysis, history sheet of water quality monitoring stations, chemical parameters, basic water quality standards for different uses such as irrigation, pisciculture, domestic and recreation, have also been included.

It is hoped that the information and data compiled herein will be useful to user agencies concerned with water quality. Comments and suggestion for improvement of this volume are welcome. The efforts put in by all the concerned officers and staffs of Mahi Division, Tapi Division and Hydrological Observation Circle, Gandhinagar under NTBO, Central Water Commission is gratefully acknowledged.

Vimal

September 2017
Gandhinagar

Vimal Kumar
Superintending Engineer

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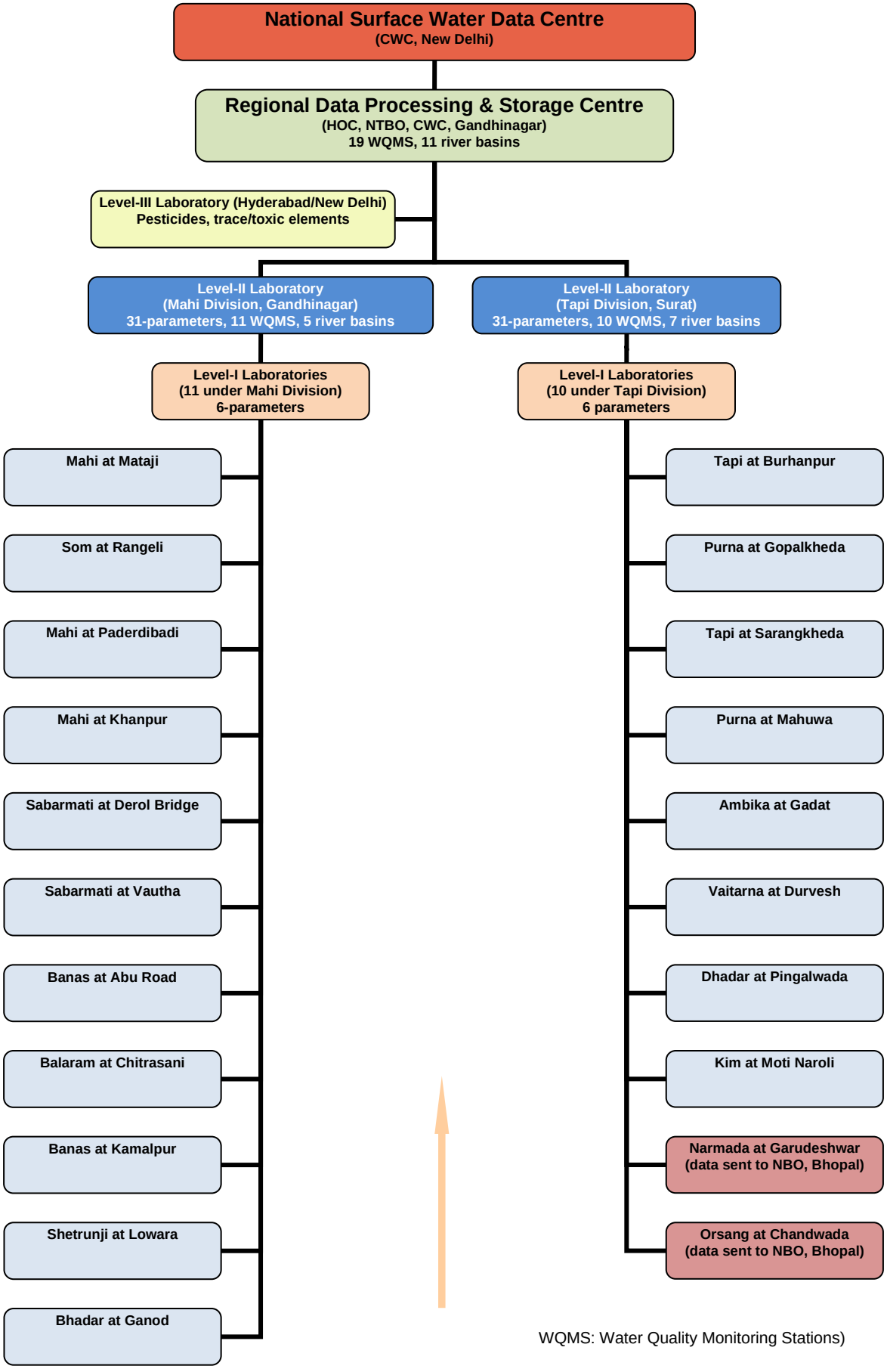
C O N T E N T S

List of Maps and Line diagrams

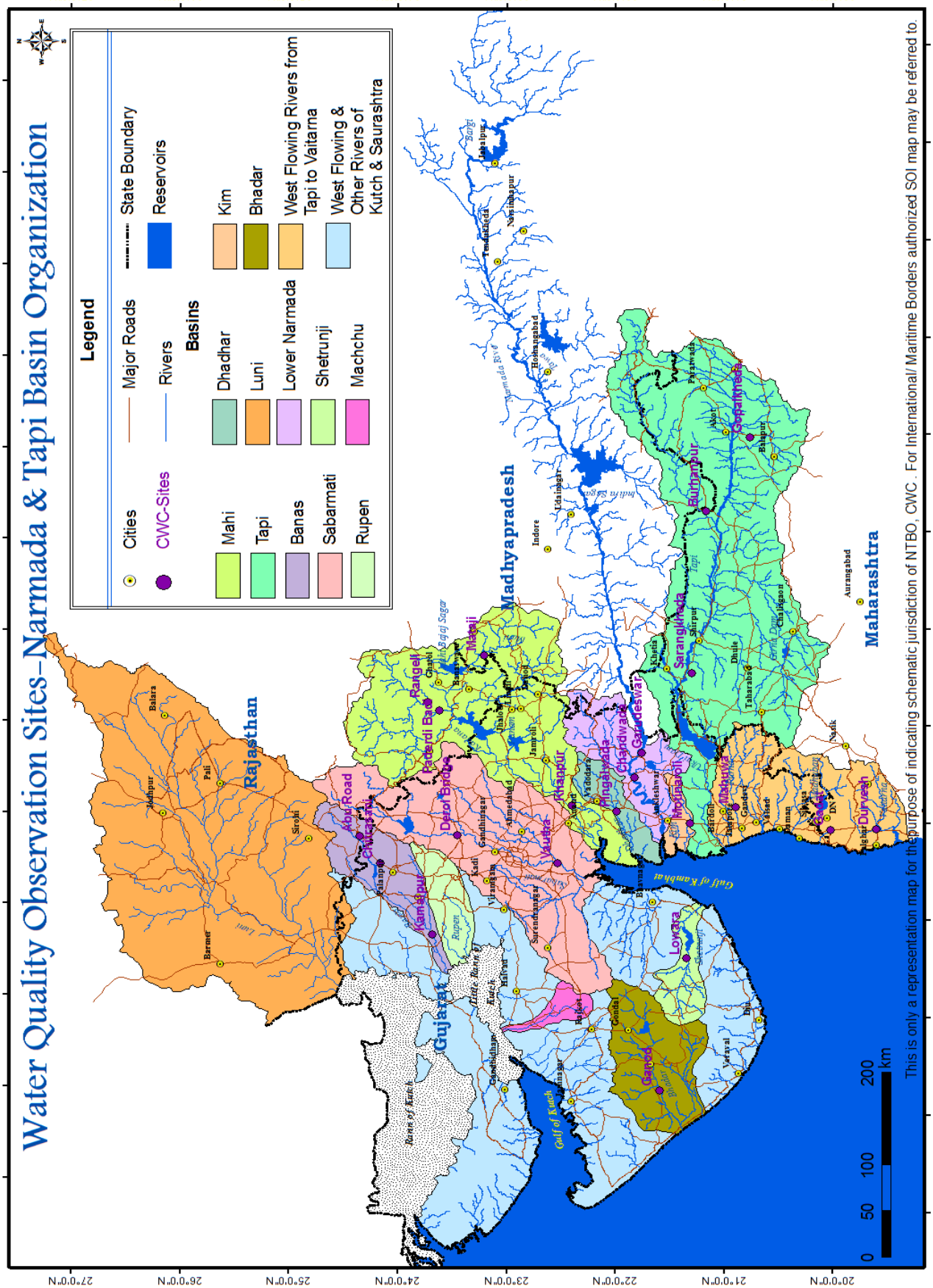
List of Annexure

Water Quality Analysis- Flow of Data

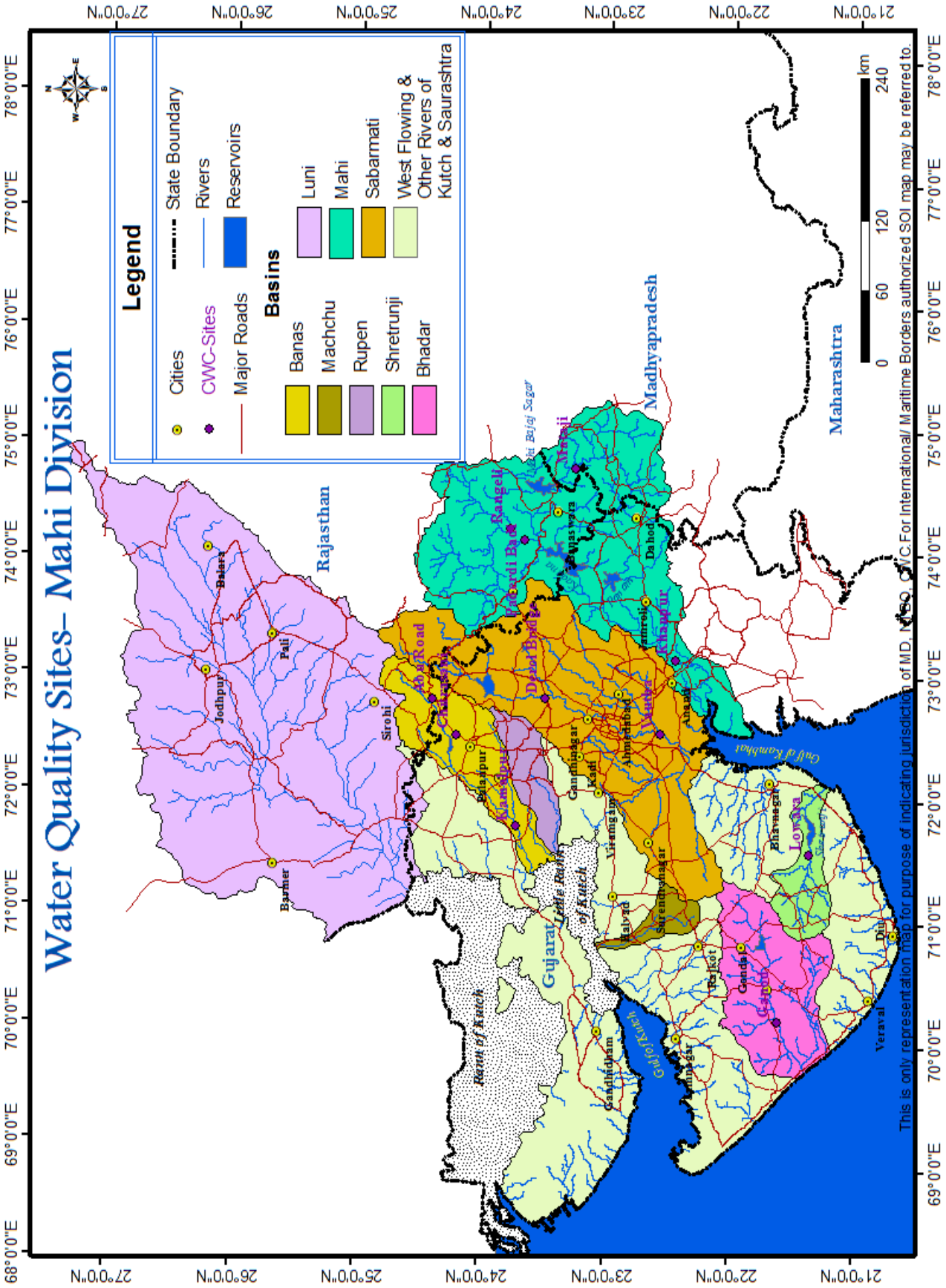


WQMS: Water Quality Monitoring Stations)

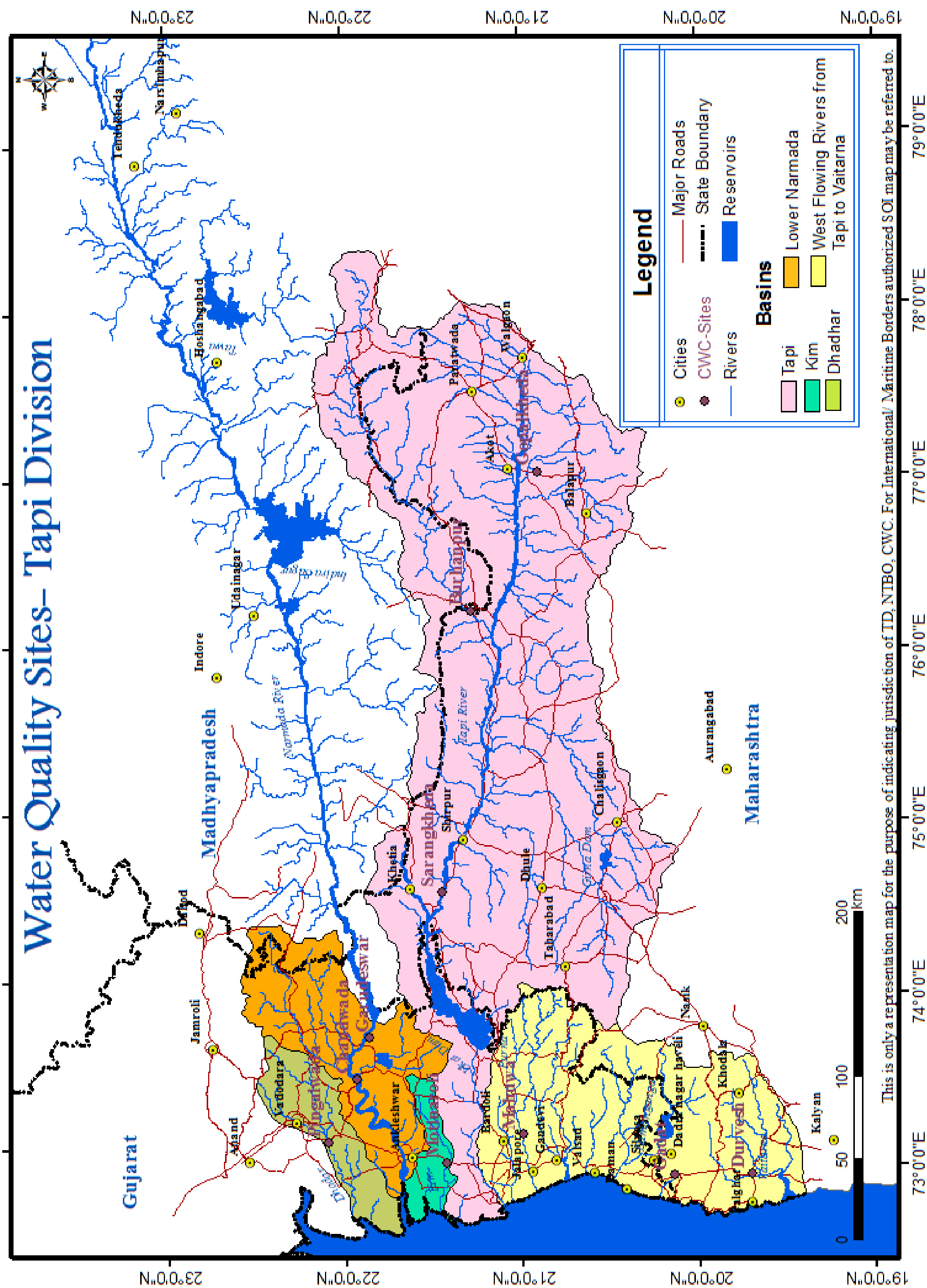
Water Quality Observation Sites under NTBO



Water Quality Observation Sites under Mahi Division



Water Quality Observation Sites under Tapi Division



ABBREVIATIONS AND SYMBOLS

General

A	:	Drinking Water Source without conventional treatment but after disinfection.
B	:	Outdoor bathing (Organised)
C	:	Drinking Water Source after conventional treatment and disinfection.
D	:	Propagation of wild life and Fisheries
E	:	Irrigation, Industrial Cooling, Controlled Waste disposal.
W. Year, WY	:	Water Year
cumec	:	Cubic meters per second
μ.mhos	:	Micro mhos per centi metre
+	:	Cation
-	:	Anion
PPM	:	Parts Per Million
meq/litre	:	Milli equivalent per litre
$Temp^0 C$	:	Temperature in degree centigrade
K^+	:	Potassium ion
Na^+	:	Sodium ion
Ca^{++}	:	Calcium ion
Mg^{++}	:	Magnesium ion
Al^{+++}	:	Aluminium ion
Fe^{+++}	:	Ferric ion
$NH4^+$	:	Ammonium ion
$CO3^{--}$	:	Carbonate ion
$HCO3^-$	:	Bicarbonate ion
Cl^-	:	Chloride ion
F^-	:	Fluoride ion

SO_4^{--}	:	Sulphate ion
SO_3^{--}	:	Sulphite ion
NO_3^-	:	Nitrate ion
NO_2^-	:	Nitrite ion
PO_4^{---}	:	Phosphate ion
SiO_3^{--}	:	Silicate ion
D.O.	:	Dissolved Oxygen
B.O.D.	:	Biochemical Oxygen Demand
FCol	:	Fecal Coliform
TCol	:	Total Coliform
Sod % age	:	Sodium Percentage
S.A.R.	:	Sodium Adsorption Ratio
R.S.C.	:	Residual Sodium Carbonate
MDN/MD	:	Mahi Division
HOC	:	Hydrological Observation Circle
MPN	:	Most Probable Number
mg/l	:	Milligram per litre
Max	:	Maximum
Min	:	Minimum
W.Q.	:	Water Quality
sq. kms	:	Square Kilometre
m	:	Metre
T.D.S.	:	Total Dissolved Solids
SNR	:	Sample Not Received
NF	:	No Flow
RD	:	River Dry

Water quality parameters used in test results

FLD	**Field Determinations**
Colour_Cod	Colour
Colour_Cod	Colour
DO	Dissolved oxygen
DO	Dissolved oxygen
EC_FLD	Electrical Conductivity_Field
Odour_Code	Odour
pH_FLD	pH_Field
Temp	Temperature
General parameters	
DO_SAT%	Dissolved Oxygen Saturation %
EC_GEN	Elecrtical Conductivity
pH_GEN	pH
SS	Solids, Suspended
TDS	Solids, Total Dissolved
TS	Solids, Total
Turb	Turbidity
Nutrients	
NH3-N	Nitrogen, ammonia
NO2+NO3	Nitrogen, Total Oxidised (NO2+NO3)
NO2-N	Nitrogen, Nitrite
NO3-N	Nitrogen, Nitrate
P-Tot	Phosphorus, total

Organic Matter

BOD3-27	Biochemical Oxygen demand (3days)
COD	Chemical Oxygen Demand

Bacteriological

FCol	Fecal Coliform
TCol	Total Coliform

Alkallnity

Alk-Phen	Alkalinity, phenolphthalein
ALK-TOT	Alkalinity, total

Hardness

HAR_Ca	Hardness, Calcium
HAR_Total	Hardness , Total

Major Ions

Ca	Calcium
Cl	Chloride
CO3	Carbonate
HCO3	Bicarbonate
K	Potassium
Mg	Magnesium
Na	Sodium
Na%	Percent Sodium
RSC	Residual Sodium Carbonate
SO4	Sulphate

Other inorganics

Al	Aluminium
B	Boron
F	Fluoride
Fe	Iron
SAR	Sodium Adsorption Ratio
SiO2	Silicate

Trace and Toxic

As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper
Hg	Mercury
Mn	Manganese
Ni	Nickel
Pb	Lead
Zn	Zinc

Pesticides

Aldrin	Aldrin
BHC	gamma-BHC (Benzene Hexa Chloride)
DDT	Dichloro Diphenyl Trichloroethane.
Dieldrin	Dieldrin
Endos	Endosulphan

1 Introduction

1.1 Scope

Central Water Commission maintains adequate hydrological observation network including select water quality monitoring stations through a three tier laboratory system at 371 key locations covering all the major river basins of India. Under Narmada & Tapi Basin Organization (NTBO), there are 21 field water quality monitoring stations or sites in 12 river basins in the states of Madhya Pradesh, Maharastra, Rajasthan and Gujarat, where physical parameters such as temperature, colour, odour, specific conductivity, total dissolved solids, pH and dissolved oxygen of river water are observed. There are two Level–II laboratories to analyse twenty five physico-chemical and bacteriological parameters of river water. Other parameters like heavy metals / toxic parameters and pesticides etc are also tested including isotope fingerprinting. This *Water Quality Data Year Book* contains water quality data collected at the above network during 2015-16. Data collected from 19 of these stations in 11 river basins is compiled and presented in this Year Book along with trends of major quality parameters which are used as criteria to determine class of water for designated best use. The data has been compiled basin-wise. The data pertaining to two stations in one basin viz the Narmada is published by Narmada Basin Organization of Central Water Commission. Location of these stations is shown in **Map-1**.

A list of the stations where water quality observations were conducted during the year 2015 - 16 are given in **table-1**.

Table-1: Water quality monitoring Stations or Sites during the water year 2015 - 16

SI.NO.	Name of Station	Code No.	River / Tributary	Basin
1	Mahi at Mataji	01 02 13 001	Mahi	Mahi
2	Som at Rangeli	01 02 13 005	Som	Mahi
3	Mahi at Paderdibadi	01 02 13 006	Mahi	Mahi
4	Mahi at Khanpur	01 02 13 012	Mahi	Mahi
5	Sabarmati at Derol Bridge	01 02 12 006	Sabarmati	Sabarmati
6	Sabarmati at Vautha	01 02 12 013	Sabarmati	Sabarmati
7	Shetrunji at Luwara	01 02 09 001	Shetrunji	Shetrunji
8	Bhadar at Ganod	01 02 07 001	Bhadar	Bhadar
9	Banas at Abu road	01 02 02 002	Banas	Banas
10	Banas at Kamalpur	01 02 02 007	Banas	Banas
11	Balaram at Chitrasani	01 02 02 004	Balaram	Banas

12	Tapi at Burhanpur	01 02 17 002	Tapi	Tapi
13	Purna at Gopalkheda	01 02 17 004	Purna	Tapi
14	Tapi at Sarangkheda	01 02 17 015	Tapi	Tapi
15	Purna at Mahuwa	01 02 19 001	Purna	Purna
16	Ambika at Gadat	01 02 20 001	Ambika	Ambika
17	Vaitarna at Durvesh	01 02 25 001	Vaitarna	Vaitarna
18	Dhadar at Pingalwada	01 02 14 001	Dhadar	Dhadar
19	Kim at Motinaroli	01 02 16 001	Kim	Kim
20	Narmada at Garudeshwar	01 02 15 030	Narmada	Narmada
21	Orsang at Chandwada	01 02 15 032	Orsang	Narmada

1.2 Sources of Information

Samples of river water have been collected by the field offices of two divisions, viz. Mahi Division, Gandhinagar and Tapi Division, Surat under the Hydrological Observation Circle, Gandhinagar. These samples are tested for various parameters at three tier network of laboratories viz. Level-I at Filed monitoring station itself, level-II at the Divisional Headquarters at Gandhinagar and Surat and Level-III at New Delhi. The Division wise distribution of stations is as under:

SI.No.	Name of Division	No. of Water Quality Station
1.	Mahi Division,Gandhinagar	11
2.	Tapi Division, Surat	10*

** Data of 2 sites published by NBO, CWC, Bhopal.*

Division-wise list of Water Quality Monitoring Stations is given as under:

SI.No.	**Stations under Mahi Division**	**SI.No**	**Stations under Tapi Division**
1.	Mahi at Mataji	1	Tapi at Burhanpur
2.	Som at Rangeli	2.	Purna at Gopalkheda
3.	Mahi at Paderdibadi	3.	Tapi at Sarangkheda
4.	Mahi at Khanpur	4.	Purna at Mahuwa
5.	Sabarmati at Derol Bridge	5.	Ambika at Gadat
6.	Sabarmati at Vautha	6.	Vaitarna at Durvesh
7.	Banas at Abu road	7.	Dhadar at Pingalwada
8.	Banas at Kamalpur	8.	Kim at Motinaroli

9.	Balaram at Chitrasani	9.	Narmada at Garudeshwar
10.	Shetrunji at Luwara	10.	Orsang at Chandwada
11.	Bhadar at Ganod		

1.3 Laboratories & Parameters

As stated above, various parameters are tested in laboratories divided in three levels. There is no Level-III laboratory under NTBO. Therefore, parameters designated for test at Level-III lab are sent to Delhi/Hyderabad. The level of the laboratory is an indication of the analytical capacity of the laboratory as given below. A few photographs of Level-II laboratories at Gandhinagar and Surat are given in subsequent pages of this report

Level I	Laboratory located in the field, generally analysing Temperature, pH, Conductivity, Dissolved Oxygen, colour and odour
Level II	Laboratory has facilities to analyse basic water quality parameters, nutrients, indicators of organic and bacteriological pollution etc.
Level III	Laboratory has facilities to analyse basic water quality parameters, nutrients, indicators of organic and bacteriological pollution etc. Laboratory is in possession of advanced equipment, such as Atomic Adsorption Spectrophotometer (AAS), Gas Chromatograph (GC), UV-Visible Spectrophotometer etc.

1.4 Methodology

Water samples are collected at a regular frequency- of once a month or bimonthly, usually on the first working day of the month at all Water Quality Monitoring Stations. Monthly /bimonthly collection of water samples started from August 2004 onwards. These water samples are usually collected from a point, 15 to 20 cm below the water surface having maximum depth of flow along the cross-section of river. Water samples are collected in clean and pre rinsed polythene bottles of 1 liter capacity and bottles are filled up to their full capacity without any air bubble.

The samples, thus collected, are sent to Divisional Laboratories located at Gandhinagar and Surat by special messenger so as to reach within 24 - 48 hours of collection. Their particulars like in-situ temperature, depth, velocity etc. written on paper slip are pasted on the polythene bottles. Six physical parameters are tested either in situ or at the field water

quality monitoring station i e Level-I lab. Various methods and procedure adopted for testing physical and chemical characteristics are as follows.

1.4.1 Physical Characteristics

- Discharge by current meter or float method.
- Temperature in degree centigrade in situ by thermometer.
- Conductivity in micro-mhos/cm measured with the help of Electric conductivity meter.
- p^H values determined using p^H meter.

1.4.2 Chemical Characteristics

- **Titrimetric Method**

Parameters determined by this technique are Carbonate, Bicarbonate, Chloride, Calcium and Magnesium. In this procedure, determining the volume of a solution of accurately known concentration, which is required to tract quantitatively with the solution of the substance to be determined, carries out quantitative chemical analysis.

- **Spectro- photometric / colorimetric Method**

Parameters analysed are Aluminium, Iron, Ammonium, Fluoride, Nitrate, Nitrite Phosphate and Silicate. In this technique, the instruments used are Colorimeter/Spectro-photometer, based on the phenomenon of absorption/ transmission of light. A series of standard solution of known concentrations are prepared and treated with appropriate reagents to produce coloured solution. Then the light of specific wavelength is passed through the standard solution. A calibration curve is drawn with concentration against measured absorbance transmittance. Water samples are treated with the same reagents for colour development and absorbance/transmittance are measured. Concentration is then determined from calibration curve.

- **Flame photometric method.**

The parameters estimated through this technique are sodium and potassium. The emission intensity from standard solution is measured by aspirating with the flame and calibration curve of emission intensity against concentration of standard solution is plotted. Then the test samples are aspirated for flame emission. The amount of element present (sodium and

potassium) in the sample is determined from the calibration curve drawn with the result of standard solutions.

- **Nephelometric Method.**

The parameter estimated by this instrument is Sulphate. The degree of the light scattered by a series of standard solutions treated with Barium Chloride is measured. A Calibration curve of scattered intensity against concentration of solution is plotted. Then the test samples are allowed for scattering. The concentration of Sulphate in the sample is determined from the calibration curve drawn with the results of standard solutions.

1.5 Method of Presentation

Presentation of water quality data is arranged according to the basin. At the outset, basin description and basin map showing locations of water quality monitoring stations is given. Site-wise availability of data is then dealt with followed by analysis of data and inferences. Subsequently, water quality data is given site-wise. Water quality data are arranged by water quality monitoring station (WQMS). It comprises history sheet of WQMS and test results obtained from various samples collected at that WQMS. The series of WQMS is arranged from the origin of the river to downstream giving inter se priority to intermediate tributary stations in a similar fashion. Explanatory notes are given Section- 2.2.2 to help readers of this year book.

History sheet gives brief historical and technical details of the WQMS. The water quality analysis tables are given for the river water only. For all the WQMS, some of the parameters may not have been analyzed owing to factors beyond control.

The tables showing tolerance limits of water quality parameters for various use of water as per **IS:-10500:2012, IS-13891:2008, IS-3328:2008, IS-11624:2009** are appended at the end, for ready reference.

1.6 Explanatory Notes

The explanatory notes described hereunder are designed to assist in the interpretation of various parameter contained in the data presented subsequently. The notes are valid so far data presented in this book.

1. The water samples are collected at regular frequency of twice in a month at all Water Quality Monitoring Stations, under Mahi Division, Gandhinagar and Tapi Division, Surat, usually from the main flow portion of the stream. Collection of water samples on monthly & once in two month basis started from August 2004 onwards

2. Parameters presented for different stations in the book are analysed in Divisional laboratories located at Gandhinagar and Surat during the period.

3. Parameters viz. Specific Conductivity, p^H, Potassium, Sodium, Calcium, Magnesium, Aluminium, Iron, Ammonium, Carbonate, Bicarbonate ,Chloride , Fluoride, Sulphate, Nitrate, Nitrite, Phosphate and Silicate were analysed in divisional laboratories of Mahi Division, Gandhinagar and Tapi Division, Surat .

4. Chemical indices namely Hardness number , Sodium percentage , Sodium Adsorption ratio and Residual Sodium Carbonate are Calculated as follows:-

(a) Hardness number (H.No.) is calculated by adding the total Calcium and Magnesium in the expressed as equivalent parts of $CaCO_3$.

(b) Sodium percentage is as given below:

$$S.P. = \frac{Na^+ \times 100}{Ca^{++} + Mg^{++} + Na^+ + K^+}$$

Where ionic concentration being in m.eq./litre.

(c) Sodium Adsorption ratio (SAR) is given by

$$S.A.R. = \frac{Na^+}{[(Ca^{++} + Mg^{++})/2]^{1/2}}$$

Where, ionic concentration being m.eq./litre.

(d) Residual Sodium Carbonate (RSC) is given below by

$$R.S.C. = (CO_3^{--} + HCO_3^-) - (Ca^{++} + Mg^{++})$$

Where, concentration of all the ions being in m.eq./litre.

5. Water year ranges from June 1st of one calendar year to May 31st of the next calendar year and covers one complete hydrological cycle.

6. Measuring authority refers to the field division responsible for the collection of water samples. The name of the division is abbreviated by taking first alphabet of each word followed by alphabets “DN” or “D” for division. Thus Mahi Division is denoted as “MDN” or “MD” and Tapi Division is denoted as “TDN” or “TD”.

7. The gauging station code number is a unique Nine-figure numeric reference number of the form XX XX XX XXX, which facilitates storage and retrieval of water quality data in data The first two digits indicates the measuring authority who is wholly responsible for R&M of site, next two digits show the basin/zone and river identification, for example, 01 for west coast, Gujarat or 02 for west coast, Maharastra. Further two digits indicate name of River in Basin, for example, 13 is for Mahi Basin and the last three digits represent the site number, for example 005 is for Rangeli site of Mahi Basin.

Various equipment at Level-II Labs

Level-II Laboratory at Gandhinagar

Level-II Laboratory at Gandhinagar

Level-II Laboratory at Gandhinagar

UV Visible Spectro-photometer **Level-II Laboratory at Gandhinagar**

Level-II Lab- Reagent Area **Level-II Laboratory at Gandhinagar**

Flame photometer **Level-II Laboratory at Gandhinagar**

Bacteriological Laboratory at Mahi Division, Gandhinagar

Bacteriological Laboratory at Mahi Division, Gandhinagar

LEVEL II LAB, TAPI DIVISION SURAT

Table-2: Water Quality Criteria as per Central Pollution Control Board

Designated-Best-Use	*Class of water*	*Criteria*
Drinking Water Source without conventional treatment but after disinfection	**A**	• Total Coliforms Organism MPN/100ml shall be 50 or less • pH between 6.5 and 8.5 • Dissolved Oxygen 6mg/l or more • Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organised)	**B**	• Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more • Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	**C**	• Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more • Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	**D**	• pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more • Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	**E**	• pH between 6.0 to 8.5 • Electrical Conductivity at 25°C micro mhos/cm Max.2250 • Sodium absorption Ratio Max. 26 • Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

Note: *(i) Boron have not been tested by this organization.*

(ii) BOD in this report is taken for 3 days at 27^0C.

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MAHI BASIN

2.0 Mahi Basin

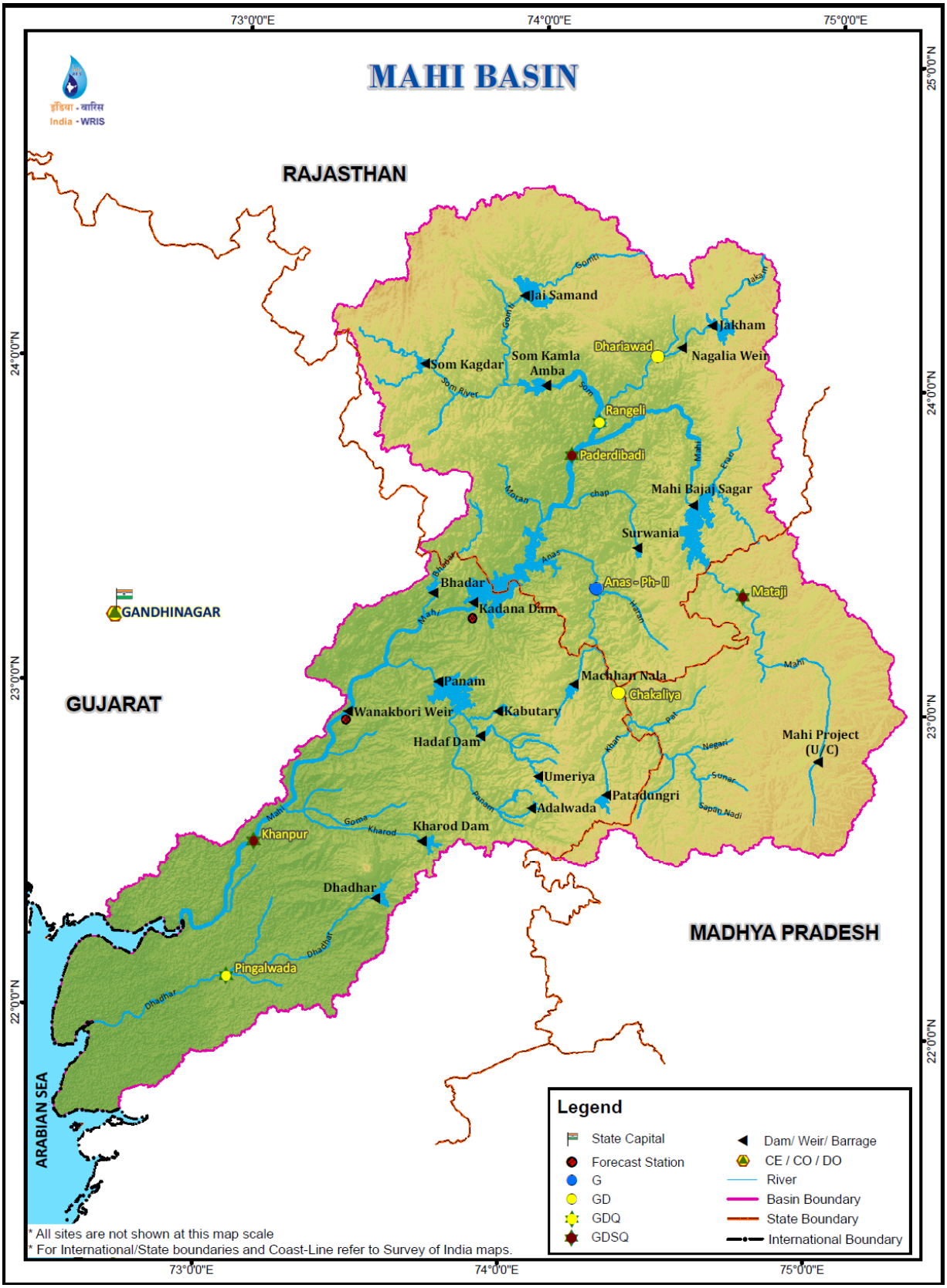
2.1 Basin description

The river Mahi is third major west flowing interstate river of India, draining into the Gulf of Cambay. Its basin map is enclosed. It originates in the northern slopes of Vindhya hill range near village Sardarpur in Dhar district of Madhya Pradesh at an elevation of 500 m above mean sea level. Its length is 583 km, traversing 167 km in Madhya Pradesh, 174 km in Rajasthan and the remaining 242 km in Gujarat. It flows initially in North West direction through Dhar and Jhabua districts of Madhya Pradesh. Thereafter, it takes turn to the left and flows in south – west direction through Banswara district of Rajasthan, Panchmahal and Kheda districts of Gujarat State before draining into Gulf of Cambay. It drains an area of 34,842 sq.km, spread over Rajasthan (47%), Madhya Pradesh (19%) and Gujarat (34%). The basin lies between the geographical co-ordinates of 73^0 00' to 74^0 20' east longitudes and 22^0 30' to 24^0 20' north latitudes. The basin is bound by the Aravalli hills in north and north-west, by the ridge separating it from Chambal basin in the east, by the Vindhya hill range in the south and finally by Gulf of Cambay in the west. In Rajasthan, the basin consists of hills, forests and eroded terrain. In Gujarat upto the confluence of Mahi and Panam, the basin comprises semi developed lands. Below Wanakbori Weir and up to the mouth, the basin is flat, fertile and well developed alluvial track.

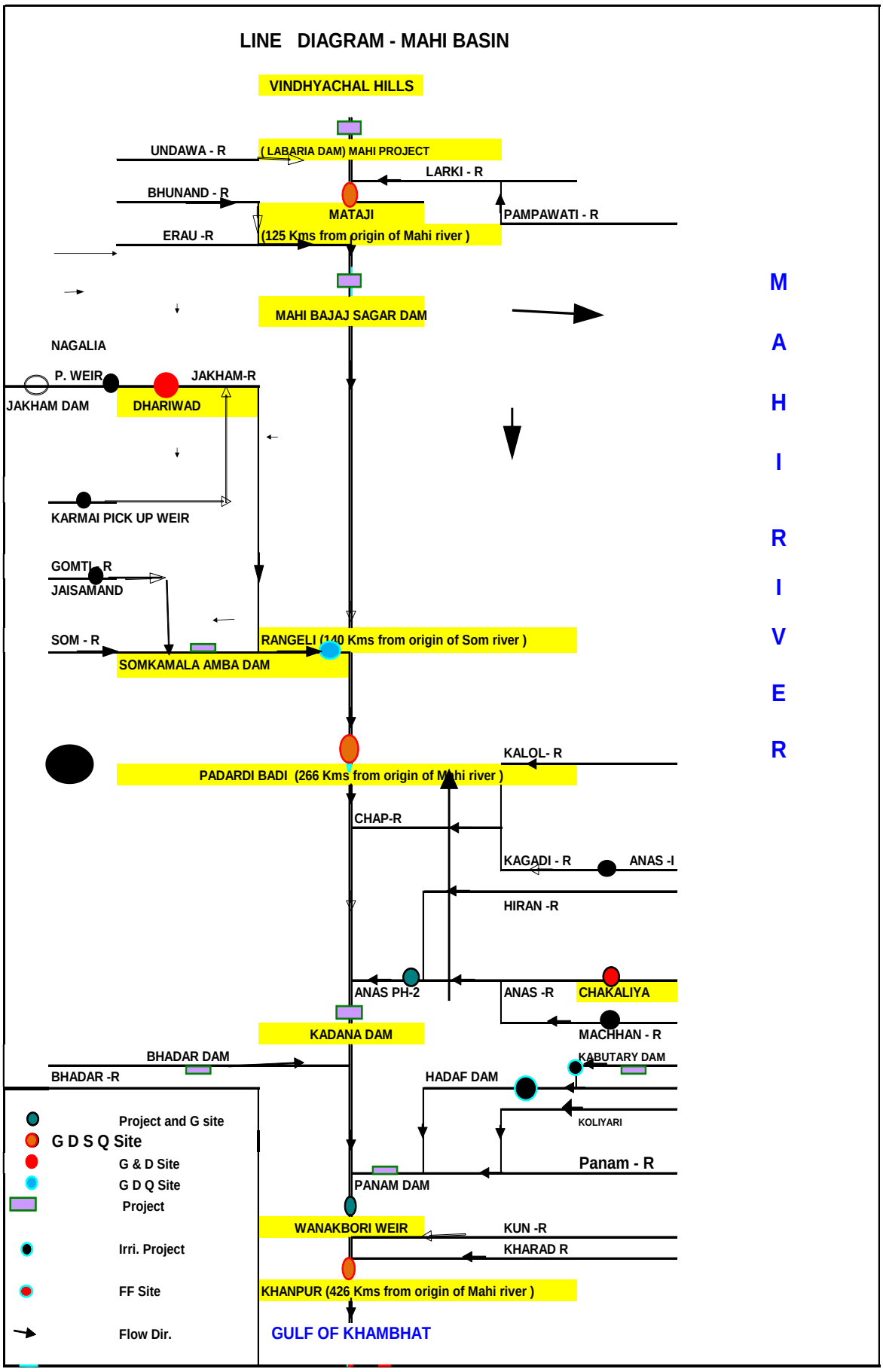
The Mahi river receives several tributaries on both banks out of which the main tributaries are Som, Anas and Panam. The Som River joins the main river on the right Bank in Rajasthan. The Anas and Panam join the main river on the left Bank in the Rajasthan & Gujarat respectively.

The average rainfall in Mahi basin is 785 mm. In the dry cool winter, the minimum temperature varies from 5°C to 20°C. Maximum temperature varies from 30°c to 50°c during the hottest month of May.

At present there are 15 completed major / medium projects in Mahi basin. The two main projects across Mahi are Mahi Bajaj Sagar and Kadana reservoir. A weir at Wanakbori is also constructed across the main river. Other 11 projects are on different tributaries of Mahi River.


MAHI BASIN
इंडिया - वारिस
India - WRIS
RAJASTHAN
GUJARAT
MADHYA PRADESH
GANDHINAGAR
ARABIAN SEA
Jai Samand
Jakham
Dhariawad
Nagalia Weir
Som Kagdar
Som Kamla Amba
Rangeli
Paderdibadi
Mahi Bajaj Sagar
Surwania
Bhadar
Kadana Dam
Anas - Ph- II
Mataji
Panam
Machhan Nala
Chakaliya
Wanakbori Weir
Kabutary
Hadaf Dam
Mahi Project (U/C)
Umeriya
Patadungri
Adalwada
Kharod Dam
Khanpur
Dhadhar
Pingalwada
Legend
State Capital
Forecast Station
G
GD
GDQ
GDSQ
Dam/ Weir/ Barrage
CE / CO / DO
River
Basin Boundary
State Boundary
International Boundary
* All sites are not shown at this map scale
* For International/State boundaries and Coast-Line refer to Survey of India maps.
73°0'0"E
74°0'0"E
75°0'0"E
25°0'0"N
24°0'0"N
23°0'0"N
22°0'0"N

LINE DIAGRAM - MAHI BASIN



2.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Mahi at Mataji**	**Code**	**:** 01 02 13 001
State	: Madhya Pradesh	District	Ratlam
Basin	: Mahi	Independent River	: Mahi
Tributary	: Mahi	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Mahi
Division	: Mahi Division, Gandhinagar	Sub-Division	: Mahi S-Div Kadana
Drainage Area	: 3880 Sq. Km.	Bank	: Left
Latitude	: 23°20'57" N	Longitude	: 74°43'31" E
	Opening Date	Closing Date	
Gauge	: 21-07-1982		
Discharge	: 21-07-1982		
Sediment	: 21-07-1982		
Water Quality	: 21-07-1982		

Water Quality Datasheet for the period : 2015-2016

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **River Water Analysis** **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	4.867	5.007	374.0	22.17	3.828	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		Light Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	413		395		410		412		408		410	
4	EC_GEN (µmho/cm)	305		321		461		450		315		384	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	8.2		8.3		8.2		8.1		8.0		8.0	
7	pH_GEN (pH units)	8.4		8.2		8.5		8.0		8.3		7.9	
8	SS (mg/L)	76		82		44		20		22		20	
9	TDS (mg/L)	196		200		302		284		194		246	
10	Temp (deg C)	28.0		28.0		26.0		22.0		19.0		24.0	
11	Turb (NTU)	4.0		54.0		4.0		2.0		1.0		7.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	5.8		0.0		10.0		0.0		11.6		0.0	
2	ALK-TOT (mgCaCO3/L)	95		104		140		128		115		140	
3	Ca (mg/L)	29		40		48		55		46		47	
4	Cl (mg/L)	22.0	O	12.0	O	30.0	O	32.0	O	20.0	O	30.0	O
5	CO3 (mg/L)	7.0	N	0.0	N	12.0	N	0.0	N	14.0	N	0.0	N
6	F (mg/L)	0.46	C	0.07	C	0.10	C	0.52	C	0.43	C	0.80	C
7	Fe (mg/L)	0.4	E	0.3	E	0.4	E	0.3	E	0.3	E	0.3	E
8	HCO3 (mg/L)	102		127		146		156		112		171	
9	K (mg/L)	0.8		0.9		1.0		0.9		0.7		0.9	
10	Mg (mg/L)	11.2	I	10.0	I	14.6	I	10.0	I	8.0	I	12.2	I
11	Na (mg/L)	14.4	N	9.2	N	22.7	N	21.6	N	15.4	N	21.6	N
12	NH3-N (mg N/L)			0.34		0.38		0.36		0.11		0.07	
13	NO2+NO3 (mg N/L)	0.75	2	5.50	2	5.47	2	5.22	2	4.10	2	0.55	2
14	NO2-N (mgN/L)	0.01		0.03		0.03		0.03		0.04		0.06	
15	NO3-N (mgN/L)	0.74	M	5.47	M	5.44	M	5.19	M	4.06	M	0.49	M
16	P-Tot (mgP/L)	0.010	O	0.070	O	0.080	O	0.070	O	0.060	O	0.060	O
17	SiO2 (mg/L)	30.4	N	46.1	N	45.2	N	44.0	N	35.3	N	38.3	N
18	SO4 (mg/L)	12.9	T	16.7	T	17.3	T	17.8	T	14.7	T	15.8	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)	3.4		0.2		2.8		4.0		2.0		4.2	
2	COD (mg/L)	17.7		46.5		83.2		21.0		5.0		8.0	
3	DO (mg/L)	6.7		4.8		7.5		6.6		8.3		5.4	
4	DO_SAT% (%)	86		62		92		75		89		64	
5	FCol-MPN (MPN/100mL)	260		17000		490		270		45		20	
6	Tcol-MPN (MPN/100mL)	58000		26000		7700		320		78		70	
	TRACE & TOXIC												
1	Al (mg/L)	0.05		0.05		0.05		0.06		0.04		0.03	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	73		100		120		136		115		118	
2	HAR_Total (mgCaCO3/L)	120		142		181		178		149		169	
3	Na% (%)	21		12		21		21		18		22	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	0.6		0.3		0.7		0.7		0.6		0.7	
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub Divi. : Mahi Sub Div., Kadana**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																						
a	Trace and Toxic			**01.04.2006**	**02.04.2007**	**02.04.2008**	**01.04.2009**	**01.04.2010**	**01.04.2011**	**01.09.2011**	**01.02.2012**	**02.04.2012**	**28.05.2012**	**01.10.2012**	**01.03.2013**	**01.04.2013**	**01.08.2013**	**01.04.2014**	**15.05.2014**	**01.11.2014**	**02.02.2015**	**01.04.2015**	**01.05.2015**	**01.12.2015**	**01.04.2016**	**01.04.2016**
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-			-	0.25				9.05	0.11	0.00	0.24	0.975	6.68	-	-	0.351	1.07	1.56	0.011	0.93
2	Cd	Cadmium	microgram / l	8.0	7.00	0.40			0	0.06				0.11	0.20	3.11	0.15	0.00	0.03	0.21	0.33	1.00	0.08	0.02	0.00	0.52
3	Cr	Chromium	microgram / l	23.0	12.00	0			0	4.28				1.94	2.61	2.01	0.04	0.00	1.42	26.34	0.80	0.00	0.72	1.06	0.00	1.30
4	Cu	Copper	microgram / l	-	-	-			-	19.03				6.01	4.24	-	6.62	-	1.74	21.96	14.18	-	1.96	2.00	-	6.68
5	Hg	Mercury	microgram / l	-	6.021	0			-	3.49				-	0.26	0.171	BDl	0.086	-	-	-	0.07	-	-	0.21	-
6	Ni	Nickel	microgram / l	0	0	5.80			0	-				0.52	7.95	0.85	10.73	0.00	1.55	2.12	4.49	1.75	0.62	0.27	1.75	0.96
7	Pb	Lead	microgram / l	186	14.00	9.31			30.81	2.84				3.04	4.86	0.00	0.33	0.00	0.035	1.03	1.32	10.0	0.16	0.61	0.00	4.45
8	Zn	Zinc	microgram / l	107	29.00	19.19	R	R	24.16	31.62	R	R	R	17.97	4.30	18.52	1.00	47.70	1.00	142	8.90	3.00	3.60	3.20	6.02	1.90
b	Pesticides		microgram / l				I	I			I	I	I													
1	Aldrin	Aldrin	microgram / l	0.017	0.01	0	V	V	0	-	V	V	V	-	-		-		-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l	0.031	0.01	0.02	E	E	0.226	-	E	E	E	-	-		-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l	0	0.01	-	R	R	-	-	R	R	R	-	-		-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	0.042	0.01	-	D	D	-	-	D	D	D	-	-		-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l	-	0.02	-	R	R	-	-	R	R	R	-	-		-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l	0	0.03	0	Y	Y	0	-	Y	Y	Y	-	-		-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l	0.005	0.08	0			0.025	-				-	-		-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l	0.003	0.01	0.02			0.412	-				-	-		-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l	0.005	0.02	-			-	-				-	-		-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l	0.006	0.01	-			-	-				-	-		-		-	-	-	-	-	-	-	-

Pesticides value not reported .

Pesticides value not reported .

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Mahi at Mataji (01 02 13 001) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	6528	0.000	75.50
2	EC_FLD (µmho/cm)	6	413	395	408
3	EC_GEN (µmho/cm)	6	461	305	373
4	pH_FLD (pH units)	6	8.3	8.0	8.1
5	pH_GEN (pH units)	6	8.5	7.9	8.2
6	SS (mg/L)	6	82	20	44
7	TDS (mg/L)	6	302	194	237
8	Temp (deg C)	6	28.0	19.0	24.5
9	Turb (NTU)	6	54.0	1.0	12
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	11.6	0.0	4.6
2	ALK-TOT (mgCaCO3/L)	6	140	95	120
3	Ca (mg/L)	6	55	29	44
4	Cl (mg/L)	6	32.0	12.0	24.3
5	CO3 (mg/L)	6	14.0	0.0	5.5
6	F (mg/L)	6	0.80	0.07	0.4
7	Fe (mg/L)	6	0.4	0.3	0.3
8	HCO3 (mg/L)	6	171	102	136
9	K (mg/L)	6	1.0	0.7	0.9
10	Mg (mg/L)	6	14.6	8.0	11
11	Na (mg/L)	6	22.7	9.2	17.5
12	NH3-N (mg N/L)	5	0.38	0.07	0.25
13	NO2+NO3 (mg N/L)	6	5.50	0.55	3.6
14	NO2-N (mgN/L)	6	0.06	0.01	0.03
15	NO3-N (mgN/L)	6	5.47	0.49	3.56
16	P-Tot (mgP/L)	6	0.080	0.010	0.058
17	SiO2 (mg/L)	6	46.1	30.4	39.9
18	SO4 (mg/L)	6	17.8	12.9	15.9
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	4.2	0.2	2.8
2	COD (mg/L)	6	83.2	5.0	30.2
3	DO (mg/L)	6	8.3	4.8	6.6
4	DO_SAT% (%)	6	92	62	78
5	FCol-MPN (MPN/100mL)	6	17000	20	3014
6	Tcol-MPN (MPN/100mL)	6	58000	70	15361
	TRACE & TOXIC				
1	Al (mg/L)	6	0.06	0.03	0.05
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	136	73	111
2	HAR_Total (mgCaCO3/L)	6	181	120	156
3	Na% (%)	6	22	12	19
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	0.7	0.3	0.6
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Mahi at Mataji (01 02 13 001) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Mahi | **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	Flood											Winter										Summer									
		Jun - Oct											Nov - Feb										Mar - May									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																
1	Q (cumec)	324.0	358.5	59.58	6.477	33.82	58.57	341.0	202.6	237.3	114.6	81.98	0.431	1.975	2.220	0.591	1.619	1.785	0.772	1.565	42.00	1.810	0.000	0.030	0.406	0.419	0.045	0.000	0.163	0.000	0.197	0.887	2.409	0.000
2	EC_FLD (µmho/cm)	246	334	360	321	333	326	382	407	408	421	406	350	414	385	392	395	461	434	496	419	418	410	306	364	298			334		361	411	402	410
3	EC_GEN (µmho/cm)	245	333	347	319	310	329	347	334	331	373	362	310	399	369	378	379	401	488	414	387	346	383	295	359	299			307		359	309	312	384
4	pH_FLD (pH units)	7.4	7.3	7.5	8.0	7.9	7.7	7.7	7.5	8.1	8.1	8.2	7.8	7.2	7.6	7.9	8.0	8.3	7.1	7.2	8.1	8.1	8.0	7.9	6.9	7.7			8.2		7.9	8.0	8.1	8.0
5	pH_GEN (pH units)	8.0	8.0	8.2	8.1	8.2	7.7	7.3	7.9	8.0	8.1	8.3	8.3	8.3	8.3	8.2	8.1	8.2	7.7	8.3	8.3	8.3	8.2	8.1	8.1	8.5			7.5		8.4	8.2	8.5	7.9
6	SS (mg/L)	23	74	34	22	25	57	57	63	61	74	67	17	20	19	28	20	23	84	47	39	76	21	22	26	12			26		51	38	70	20
7	TDS (mg/L)	171	248	227	205	199	208	219	214	211	237	233	203	239	233	245	242	254	314	264	238	224	239	194	228	194			199		221	204	190	246
8	Temp (deg C)	27.6	28.6	30.1	29.4	29.5	28.9	29.2	29.4	25.7	27.0	27.3	22.1	24.1	20.4	24.4	24.4	25.1	27.1	19.4	21.0	18.5	20.5	27.0	28.0	29.0			27.5		23.7	23.0	23.0	24.0
9	Turb (NTU)	1.5	94.0	21.0	89.3	18.0	256.3	456.0	158.7	18.7	76.3	20.7	3.0	6.0	3.0	1.5	1.0	4.5	4.0	4.5	2.5	2.5	1.5	2.0	4.0	1.0			6.0		4.7	6.0		7.0
	CHEMICAL																																
1	Alk-Phen (mgCaCO3/L)	0.8	0.0	0.0	1.0	1.4	0.0	0.0	0.0	0.0	5.3	5.3	1.2	1.7	2.1	0.0	0.0	0.4	0.0	0.8	4.2	2.1	5.8	0.0	0.0	1.7			0.0		1.1	0.0	5.8	0.0
2	ALK-TOT (mgCaCO3/L)	124	160	151	178	98	112	113	116	123	125	113	182	171	124	204	116	126	152	152	140	132	122	180	189	148			98		146	116	88	140
3	Ca (mg/L)	28	29	31	31	37	40	41	43	44	43	39	32	30	30	33	40	44	59	57	53	46	50	32	30	26			34		50	45	30	47
4	Cl (mg/L)	18.0	22.0	28.0	24.5	28.0	31.3	22.7	21.3	16.0	27.3	21.3	25.0	29.0	29.0	25.0	36.0	39.5	32.0	39.5	30.0	20.0	26.0	26.0	36.0	22.0			29.0		32.0	26.0	22.0	30.0
5	CO3 (mg/L)	1.0	0.0	0.0	1.3	1.7	0.0	0.0	0.0	0.0	6.3	6.3	1.5	2.0	2.5	0.0	0.0	0.5	0.0	1.0	5.0	2.5	7.0	0.0	0.0	2.0			0.0		1.3	0.0	7.0	0.0
6	F (mg/L)	0.22	0.39	0.61	0.57	0.76	0.43	0.37	0.52	0.56	0.49	0.21	0.19	0.51	0.30	0.56	0.41	0.42	0.33	0.41	0.50	0.44	0.47	0.22	0.40	0.31			0.43		0.47	0.43	0.41	0.80
7	Fe (mg/L)	0.0	0.0	0.1	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.1	0.5	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.0	0.0	0.0			0.2		0.3	0.3	0.4	0.3
8	HCO3 (mg/L)	97	98	128	107	116	137	138	142	150	140	125	110	103	100	125	142	153	185	184	161	157	134	110	115	88			120		176	142	93	171
9	K (mg/L)	1.0	0.6	0.1	0.9	0.9	1.0	0.8	0.9	0.9	0.8	0.9	1.0	0.8	0.4	1.4	1.1	1.3	0.7	0.9	0.9	0.7	0.8	1.0	0.4	0.9			0.9		0.7	0.8	0.7	0.9
10	Mg (mg/L)	4.4	5.1	12.6	6.8	7.5	7.8	7.8	8.8	10.7	11.3	11.9	7.3	4.6	7.8	8.8	11.7	9.7	7.8	10.0	10.2	13.6	9.0	7.8	7.3	5.8			8.3		9.7	10.7	9.7	12.1
11	Na (mg/L)	12.0	15.5	20.0	17.0	19.3	23.7	16.5	15.7	11.9	18.9	15.4	15.0	21.0	20.5	18.0	24.0	29.3	23.7	27.4	22.7	13.8	18.5	16.0	28.0	16.0			21.5		22.0	19.5	13.3	21.6
12	NH3-N (mg N/L)			0.06	0.72	0.28	0.26	0.16	0.48	0.25	0.52	0.36			0.05	0.24	0.07	0.09	0.05	0.10	0.29	0.07	0.24			0.14			0.07		0.16	0.37	0.08	0.07
13	NO2+NO3 (mg N/L)	0.12	0.74	0.64	1.93	3.52	2.12	3.49	4.60	4.34	4.17	3.91	0.12	0.17	1.46	1.81	4.16	1.88	6.39	5.57	5.29	4.13	4.66	0.03	0.33	0.68			1.43		2.24	5.11	0.36	0.55
14	NO2-N (mgN/L)	0.02	0.01	0.03	0.09	0.04	0.05	0.03	0.11	0.03	0.08	0.02	0.01	0.01	0.05	0.03	0.03	0.02	0.01	0.02	0.03	0.01	0.03	0.00	0.01	0.01			0.01		0.02	0.05	0.01	0.06
15	NO3-N (mgN/L)	0.10	0.73	0.61	1.84	3.47	2.07	3.46	4.50	4.31	4.09	3.88	0.11	0.16	1.42	1.78	4.13	1.86	6.38	5.54	5.25	4.11	4.63	0.03	0.32	0.67			1.41		2.22	5.06	0.35	0.49
16	P-Tot (mgP/L)	0.010	0.025	0.010	0.100	0.087	0.070	0.067	0.063	0.077	0.067	0.053	0.030	0.015	0.025	0.055	0.100	0.060	0.070	0.072	0.055	0.075	0.065	0.020	0.010	0.020			0.060		0.080	0.050	0.070	0.060
17	SiO2 (mg/L)	11.7	19.0	37.7	29.1	32.9	32.9	39.5	40.3	40.0	42.9	40.5	17.8	16.4	27.4	33.8	36.2	31.5	60.1	39.2	41.5	35.4	39.6	17.6	22.5	24.6			34.0		38.7	37.1	33.7	38.3
18	SO4 (mg/L)	6.9	11.4	16.6	5.5	11.0	12.8	9.5	9.7	10.0	10.2	15.6	10.0	11.3	14.0	7.7	12.1	19.2	9.1	9.8	9.9	15.9	16.2	10.2	12.4	12.4			18.1		9.5	9.9	15.1	15.8
	BIOLOGICAL/BACTERIOLOGICAL																																
1	BOD3-27 (mg/L)	0.4	1.5	1.2	1.5	1.9	2.1	3.0	1.5	3.3	2.0	2.1	0.4	1.4	1.7	2.0	1.3	1.6	2.8	1.6	2.6	1.6	3.0	0.4	1.4	2.9			2.6		1.9	2.6	3.3	4.2
2	COD (mg/L)										89.5	49.1									131.3	19.4	13.0									24.3	8.0	8.0
3	DO (mg/L)	6.9	7.0	6.9	7.3	8.1	7.4	7.5	7.5	7.4	6.8	6.3	9.1	9.8	9.2	9.9	8.4	9.1	10.9	10.6	10.0	9.0	7.4	7.2	8.2	9.5			8.5		7.7	8.4	8.3	5.4
4	DO_SAT% (%)	86	91	91	95	106	95	98	98	91	86	80	104	116	101	118	100	108	137	115	112	97	82	90	105	124			106		91	98	96	64
5	FCol-MPN (MPN/100mL)										3533	5917									56	2700	158									1700	2	20
6	Tcol-MPN (MPN/100mL)										26900	30567									17252	15550	199									14800	70	70
	TRACE & TOXIC																																
1	Al (mg/L)	0.02	0.05	0.02	0.02	0.01	0.02	0.03	0.03	0.03	0.03	0.05	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.01	0.01	0.01			0.02		0.03	0.04	0.04	0.03
	CHEMICAL INDICES																																
1	HAR_Ca (mgCaCO3/L)	71	72	78	77	92	99	102	107	111	108	98	80	76	76	82	100	109	148	141	132	116	126	80	74	64			84		126	112	76	118
2	HAR_Total (mgCaCO3/L)	89	93	131	105	123	131	134	143	155	155	147	111	95	109	119	149	150	181	183	175	173	163	113	105	88			119		166	157	117	169
3	Na% (%)	21	25	25	26	25	26	20	19	14	19	18	23	32	29	25	26	30	22	24	22	15	20	23	37	28			28		22	21	20	22
4	SAR (-)	0.5	0.7	0.8	0.7	0.8	0.9	0.6	0.6	0.4	0.6	0.5	0.6	0.9	0.9	0.7	0.9	1.0	0.8	0.9	0.7	0.5	0.6	0.7	1.2	0.7			0.9		0.7	0.7	0.5	0.7
	PESTICIDES																																

POOLING CONDITION / SNR

POOLING CONDITION

POOLING CONDITION / SNR

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Som at Rangeli**	**Code**	**: 01 02 13 005**
State	: Rajasthan	District	Dungarpur
Basin	: Mahi	Independent River	: Mahi
Tributary	: Som	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Som
Division	: Mahi Division, Gandhinagar	Sub-Division	: Mahi Sub Divn., Kadana
Drainage Area	: 8329 Sq. Km.	Bank	: Right
Latitude	: 23°52'22" N	Longitude	: 74°13'25" E

	Opening Date	Closing Date
Gauge	: 15-07-1978	
Discharge	: 15-07-1978	
Sediment	:	
Water Quality	: 01-07-1988	

Water Quality Datasheet for the period : 2015-2016

Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **River Water Analysis** **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	0.555	2.882	145.0	73.73	9.839	8.296	8.404	8.617	9.021	8.069	7.752	0.000
2	Colour_Cod (-)	Clear		Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	575		450		620		620		570		585	
4	EC_GEN (µmho/cm)	702		443		461		460		498		429	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	7.9		7.6		7.9		7.9		7.5		7.8	
7	pH_GEN (pH units)	8.5		8.1		8.5		8.2		8.2		8.4	
8	SS (mg/L)	81		120		95		35		38		26	
9	TDS (mg/L)	453		275		285		285		318		278	
10	Temp (deg C)	24.0		24.0		25.0		25.0		22.0		24.0	
11	Turb (NTU)	2.0		25.0		5.0		1.0		1.0		4.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	15.8		0.0		11.6		0.0		0.0		10.0	
2	ALK-TOT (mgCaCO3/L)	196		112		132		132		160		156	
3	Ca (mg/L)	63		37		37		53		66		61	
4	Cl (mg/L)	68.0	O	36.0	O	38.0	O	36.0	O	38.0	O	36.0	O
5	CO3 (mg/L)	19.0	N	0.0	N	14.0	N	0.0	N	0.0	N	12.0	N
6	F (mg/L)	0.81	C	0.57	C	0.59	C	0.58	C	0.73	C	0.80	C
7	Fe (mg/L)	0.5	E	0.4	E	0.4	E	0.4	E	0.4	E	0.4	E
8	HCO3 (mg/L)	200		137		132		161		195		166	
9	K (mg/L)	1.1		0.9		1.1		1.0		1.1		1.2	
10	Mg (mg/L)	23.1	I	14.8	I	20.4	I	9.7	I	7.8	I	8.8	I
11	Na (mg/L)	40.4	N	25.8	N	27.9	N	27.9	N	28.9	N	27.9	N
12	NH3-N (mg N/L)	0.53		0.08		0.10		0.11		0.18		0.44	
13	NO2+NO3 (mg N/L)	0.26	2	1.66	2	1.71	2	1.64	2	1.52	2	1.43	2
14	NO2-N (mgN/L)	0.00		0.17		0.17		0.14		0.01		0.06	
15	NO3-N (mgN/L)	0.26		1.49		1.54		1.50		1.51		1.37	
16	P-Tot (mgP/L)	0.110	M	0.090	M	0.090	M	0.100	M	0.100	M	0.110	M
17	SiO2 (mg/L)	28.6	O	18.4	O	18.5	O	18.7	O	24.1	O	29.0	O
18	SO4 (mg/L)	31.6	N	31.8	N	32.5	N	32.3	N	32.9	N	33.3	N
	BIOLOGICAL/BACTERIOLOGICAL		T		T		T		T		T		T
1	BOD3-27 (mg/L)	2.9	H	4.7	H	3.1	H	1.3	H	1.6	H	2.2	H
2	COD (mg/L)	28.4		8.0		115.7		29.0		7.0		10.0	
3	DO (mg/L)	6.1		6.7		7.3		6.5		7.4		7.7	
4	DO_SAT% (%)	73		79		88		79		84		91	
5	FCol-MPN (MPN/100mL)	310		4300		140		170		18		20	
6	Tcol-MPN (MPN/100mL)	76000		9400		350		320		91		80	
	TRACE & TOXIC												
1	Al (mg/L)	0.06		0.03		0.04		0.04		0.05		0.04	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	156		92		92		132		164		152	
2	HAR_Total (mgCaCO3/L)	253		154		177		173		197		189	
3	Na% (%)	26		27		25		26		24		24	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	1.1		0.9		0.9		0.9		0.9		0.9	
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Mahi at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub Divi. : Mahi Sub Div., Kadana**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																						
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-			-	1.55	3.72	5.65	4.95	11.98	1.32	0.82	0.960	2.16	1.28	-	-	0.950	4.07	1.96	0.088	0.56
2	Cd	Cadmium	microgram / l	0.0	8.00	0.72			0	0.03	0.13	0.42	0.16	0.14	0.38	3.51	0.133	0.00	0.02	0.21	0.34	2.00	0.11	0.01	0.00	0.17
3	Cr	Chromium	microgram / l	0.0	52.00	0			0	1.31	10.59	0	13.18	5.19	1.79	1.51	0.23	0.00	1.30	22.43	0.60	0.00	0.84	1.05	0.00	0.75
4	Cu	Copper	microgram / l	-	-	-			-	5.02	53.04	-	29.4	11.51	5.54	-	1.50	-	1.11	10.37	15.59	-	2.86	1.15	-	13.52
5	Hg	Mercury	microgram / l	-	2.252	0			-	0.58	-	0	-	-	0.27	0.132	BDL	0.116	-	-	-	0.085	-	-	0.11	-
6	Ni	Nickel	microgram / l	0	0	7.48			1.34	-	12.4	0	14.24	4.32	13.34	2.26	8.41	0.00	0.80	0.60	4.99	2.89	0.60	0.43	2.89	0.31
7	Pb	Lead	microgram / l	116	12.00	16.23			32.61	2.10	3.46	26.7	5.03	3.08	2.61	0.00	0.46	0.00	0.25	4.69	4.11	15.0	0.48	0.09	0.00	1.48
8	Zn	Zinc	microgram / l	0	27.00	10.50			20.76	9.20	112.5	15.87	49.00	23.73	6.10	19.72	13.00	37.20	0.00	48.0	9.00	0.00	2.70	4.30	0.68	2.30
b	Pesticides		microgram / l																							
1	Aldrin	Aldrin	microgram / l	0	0.01	0			0	-	-	0.0015	-	-	-		-		-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l	0.006	0.01	0.01			0	-	-	0.0039	-	-	-		-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l	0	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	0	0	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l	-	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l	0	0.02	0			0	-	-	0.0004	-	-	-		-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l	0.026	0.03	0			0	-	-	0.0008	-	-	-		-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l	0	0.01	0.01			0.421	-	-	0.0691	-	-	-		-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l	0.046	0.03	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l	0.005	0.04	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-

R I V E R D R Y

Pesticides value not reported .

Pesticides value not reported .

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Som at Rangeli (01 02 13 005) **Division : Mahi Division, Gandhinagar**

Local River : Som **Sub-Division : Mahi Sub Divn., Kadana**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	473.1	0.000	21.21
2	EC_FLD (µmho/cm)	6	620	450	570
3	EC_GEN (µmho/cm)	6	702	429	499
4	pH_FLD (pH units)	6	7.9	7.5	7.8
5	pH_GEN (pH units)	6	8.5	8.1	8.3
6	SS (mg/L)	6	120	26	66
7	TDS (mg/L)	6	453	275	316
8	Temp (deg C)	6	25.0	22.0	24
9	Turb (NTU)	6	25.0	1.0	6.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	15.8	0.0	6.2
2	ALK-TOT (mgCaCO3/L)	6	196	112	148
3	Ca (mg/L)	6	66	37	53
4	Cl (mg/L)	6	68.0	36.0	42
5	CO3 (mg/L)	6	19.0	0.0	7.5
6	F (mg/L)	6	0.81	0.57	0.68
7	Fe (mg/L)	6	0.5	0.4	0.4
8	HCO3 (mg/L)	6	200	132	165
9	K (mg/L)	6	1.2	0.9	1.1
10	Mg (mg/L)	6	23.1	7.8	14.1
11	Na (mg/L)	6	40.4	25.8	29.8
12	NH3-N (mg N/L)	6	0.53	0.08	0.24
13	NO2+NO3 (mg N/L)	6	1.71	0.26	1.37
14	NO2-N (mgN/L)	6	0.17	0.00	0.09
15	NO3-N (mgN/L)	6	1.54	0.26	1.28
16	P-Tot (mgP/L)	6	0.110	0.090	0.1
17	SiO2 (mg/L)	6	29.0	18.4	22.9
18	SO4 (mg/L)	6	33.3	31.6	32.4
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	4.7	1.3	2.7
2	COD (mg/L)	6	115.7	7.0	33
3	DO (mg/L)	6	7.7	6.1	6.9
4	DO_SAT% (%)	6	91	73	82
5	FCol-MPN (MPN/100mL)	6	4300	18	826
6	Tcol-MPN (MPN/100mL)	6	76000	80	14374
	TRACE & TOXIC				
1	Al (mg/L)	6	0.06	0.03	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	164	92	132
2	HAR_Total (mgCaCO3/L)	6	253	154	190
3	Na% (%)	6	27	24	25
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	1.1	0.9	0.9
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Som at Rangeli (01 02 13 005) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Som | **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	31.31	320.2	27.17	9.405	21.76	5.227	76.25	61.25	160.9	45.16	46.39	3.060	7.012	3.267	2.428	4.846	5.552	13.75	4.847	37.85	8.194	8.584	1.462	1.847	2.454	0.228	0.541	2.121	3.730	2.607	5.999	5.086	5.274
2	EC_FLD (µmho/cm)									545	547	548								575	630	590	595								585	585	585	585
3	EC_GEN (µmho/cm)	508	261	639	456	498	439	453	520	648	523	535	493	538	513		569	590	535	572	550	545	479	493	623	593			755	486	563	592	587	429
4	pH_FLD (pH units)									8.2	7.8	7.8								7.4	9.3	7.6	7.7								7.8	7.8	7.8	7.8
5	pH_GEN (pH units)	8.2	7.9	8.3	8.1	8.2	7.9	7.5	8.2	8.2	8.3	8.3	8.2	8.3	8.5	O	8.2	8.2	8.0	8.2	8.5	8.3	8.2	8.0	8.5	8.5	O	O	7.3	8.1	8.5	8.4	8.7	8.4
6	SS (mg/L)	43	103	32	20	39	35	44	42	43	71	99	18	45	34	N	50	51	39	43	31	63	37	20	20	10	N	N	50	48	34	22	76	26
7	TDS (mg/L)	335	207	411	302	327	281	291	342	431	335	338	302	343	333	C	353	374	334	366	346	345	302	338	416	360	C	C	482	304	360	382	364	278
8	Temp (deg C)	30.8	27.7	28.0	26.0	27.0	28.0	26.7	26.5	24.8	25.8	24.3	24.5	18.0	21.5	E	21.0	23.5	20.0	17.5	21.0	19.5	23.5	23.0	21.0	26.0	E	E	28.0	26.0	20.8	20.0	24.0	24.0
9	Turb (NTU)	1.5	123.5	1.3	36.5	25.0	8.5	14.7	3.0	22.0	126.3	10.7	9.0	14.0	3.0		1.0	4.5	3.0	4.5	2.0	2.5	1.0	8.0	6.0	2.0			2.0	1.0	3.0	4.0		4.0
	CHEMICAL															I											I	I						
1	Alk-Phen (mgCaCO3/L)	1.0	0.0	1.9	4.2	0.0	0.0	0.0	0.0	1.4	7.7	9.1	0.0	1.7	7.1	N	0.8	0.8	0.0	0.0	13.7	5.0	0.0	0.0	5.0	4.2	N	N	0.0	0.0	1.7	5.8	14.1	10.0
2	ALK-TOT (mgCaCO3/L)	200	158	284	213	158	144	144	158	180	166	146	225	270	254		182	186	162	194	189	178	146	236	310	281			208	160	235	184	184	156
3	Ca (mg/L)	33	27	40	37	51	48	51	56	48	53	45	35	35	46	2	57	63	59	70	65	58	59	39	42	37	2	2	77	55	83	69	61	61
4	Cl (mg/L)	38.0	22.0	66.7	43.0	65.0	43.0	36.0	45.0	78.3	40.0	47.3	40.0	73.5	56.0		69.0	72.0	41.0	50.0	45.0	44.0	37.0	42.0	80.0	60.0			92.0	40.0	60.0	48.0	54.0	36.0
5	CO3 (mg/L)	1.3	0.0	2.3	5.0	0.0	0.0	0.0	0.0	1.7	9.3	11.0	0.0	2.0	8.5	M	1.0	1.0	0.0	0.0	16.5	6.0	0.0	0.0	6.0	5.0	M	M	0.0	0.0	2.0	7.0	17.0	12.0
6	F (mg/L)	0.27	0.25	0.79	0.76	0.79	0.49	0.55	0.76	0.64	0.56	0.66	0.67	0.67	0.48	O	0.61	0.61	0.63	0.90	0.87	0.85	0.66	0.66	0.78	0.42	O	O	0.86	0.65	0.91	0.75	0.83	0.80
7	Fe (mg/L)	0.0	0.0	0.0	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.1	N	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.0	0.0	0.1	N	N	0.5	0.4	0.5	0.5	0.5	0.4
8	HCO3 (mg/L)	121	97	171	125	193	176	176	193	216	184	156	137	163	147	T	220	225	198	237	198	205	178	144	183	166	T	T	254	195	283	210	190	166
9	K (mg/L)	1.3	1.9	1.7	1.8	1.4	0.6	0.6	0.7	1.2	0.8	1.0	2.0	1.1	0.8	H	0.9	2.2	0.8	0.9	0.9	0.7	1.0	1.0	1.1	1.7	H	H	1.7	0.8	1.0	1.0	0.9	1.2
10	Mg (mg/L)	6.8	6.8	15.5	8.3	10.2	9.7	9.4	10.2	19.4	13.6	19.4	9.3	13.1	9.2		13.1	11.2	11.7	10.7	11.7	19.2	8.8	8.7	13.6	17.5			11.7	11.7	10.7	11.7	19.2	8.8
11	Na (mg/L)	27.0	15.1	50.9	32.8	47.6	31.9	25.6	29.9	56.6	28.6	31.3	29.0	57.0	42.5	/	50.8	51.7	28.4	34.6	34.6	28.9	28.4	30.0	62.0	45.4	/	/	60.8	26.8	40.3	37.2	32.0	27.9
12	NH3-N (mg N/L)			0.06	0.75	0.44	0.11	0.17	0.45	0.64	0.55	0.24	0.06		0.06		0.08	0.15	0.23	0.23	0.36	0.15	0.15			0.10			0.38	0.38	0.38	0.61	0.45	0.44
13	NO2+NO3 (mg N/L)	0.17	0.98	1.06	1.23	0.54	1.01	1.26	1.62	2.30	0.86	1.21	0.03	1.04	0.91	P	0.44	0.28	1.89	1.76	2.59	1.02	1.58	0.03	1.02	1.99	P	P	1.06	1.80	1.10	2.58	0.23	1.43
14	NO2-N (mgN/L)	0.03	0.05	0.03	0.05	0.04	0.04	0.04	0.01	0.03	0.05	0.11	0.00	0.01	0.04	O	0.01	0.01	0.01	0.03	0.01	0.01	0.08	0.00	0.02	0.01	O	O	0.01	0.02	0.03	0.02	0.01	0.06
15	NO3-N (mgN/L)	0.15	0.93	1.03	1.18	0.50	0.97	1.21	1.61	2.27	0.81	1.10	0.03	1.03	0.87	O	0.43	0.26	1.88	1.74	2.58	1.01	1.50	0.03	1.00	1.98	O	O	1.05	1.78	1.07	2.56	0.22	1.37
16	P-Tot (mgP/L)	0.010	0.030	0.017	0.095	0.090	0.070	0.087	0.090	0.097	0.073	0.097	0.030	0.035	0.010	L	0.095	0.070	0.095	0.095	0.085	0.090	0.100	0.040	0.040	0.010	L	L	0.070	0.090	0.100	0.080	0.100	0.110
17	SiO2 (mg/L)	11.0	21.7	27.2	22.7	28.2	27.6	22.9	26.3	24.7	30.8	21.8	19.4	24.2	21.7	I	23.3	27.8	21.3	26.0	23.0	20.8	21.4	22.0	28.4	20.8	I	I	17.0	8.9	18.6	25.6	24.7	29.0
18	SO4 (mg/L)	10.5	15.3	25.8	12.8	14.6	18.3	14.6	14.8	13.9	15.2	31.9	15.6	20.4	25.5	N	13.7	24.6	15.8	8.8	15.8	19.3	32.6	15.9	20.5	25.0	N	N	25.8	16.4	10.5	15.8	19.7	33.3
	BIOLOGICAL/BACTERIOLOGICAL															G											G	G						
1	BOD3-27 (mg/L)	0.7	1.3	2.1	2.2	2.0	2.0	3.1	0.9	3.3	3.1	3.6	0.8	1.6	0.9		0.4	1.6	1.2	1.2	2.4	2.7	1.5	0.5	2.6	3.0			1.6	3.6	2.0	3.2	2.8	2.2
2	COD (mg/L)										55.2	50.7									134.1	29.6	18.0									38.7	9.0	10.0
3	DO (mg/L)	5.3	5.9	7.5	8.2	8.5	6.2	7.4	7.3	8.4	5.3	6.7	8.4	10.0	11.4	C	8.7	8.6	9.2	9.3	9.7	8.0	6.9	6.5	9.1	9.6	C	C	6.1	7.8	8.1	7.1	6.2	7.7
4	DO_SAT% (%)	72	76	96	101	107	79	93	91	100	65	80	101	105	127	O	98	101	101	97	109	87	81	76	102	118	O	O	78	96	89	78	73	91
5	FCol-MPN (MPN/100mL)										2647	1583				N					51	3320	94				N	N				2	2	20
6	Tcol-MPN (MPN/100mL)										20867	28583				D					13907	27550	206				D	D				94	76	80
	TRACE & TOXIC															I											I	I						
1	Al (mg/L)	0.01	0.06	0.02	0.02	0.01	0.01	0.02	0.02	0.05	0.03	0.04	0.01	0.02	0.02	T	0.02	0.01	0.03	0.05	0.03	0.04	0.04	0.01	0.02	0.03	T	T	0.02	0.03	0.07	0.03	0.06	0.04
	CHEMICAL INDICES															I											I	I						
1	HAR_Ca (mgCaCO3/L)	82	68	99	92	126	120	127	140	119	134	114	87	87	116	O	142	156	146	174	162	145	148	97	106	92	O	O	192	136	208	172	153	152
2	HAR_Total (mgCaCO3/L)	110	96	164	127	169	161	166	183	200	190	195	126	142	155	N	197	203	195	219	211	225	185	133	163	165	N	N	241	185	253	221	233	189
3	Na% (%)	34	25	39	36	38	28	25	26	34	23	26	33	47	37		36	35	24	26	26	22	25	33	45	37			35	24	26	27	23	24
4	SAR (-)	1.1	0.7	1.7	1.3	1.6	1.1	0.9	1.0	1.7	0.9	1.0	1.1	2.1	1.5		1.6	1.6	0.9	1.0	1.0	0.8	0.9	1.1	2.1	1.5			1.7	0.9	1.1	1.1	0.9	0.9
	PESTICIDES																																	

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Mahi at Paderdibadi**	**Code**	**: 01 02 13 006**
State	: Rajasthan	District	Dungarpur
Basin	: Mahi	Independent River	: Mahi
Tributary	: Mahi	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Mahi
Division	: Mahi Division, Gandhinagar	Sub-Division	: Mahi Sub Divn., Kadana
Drainage Area	: 16247 Sq. Km.	Bank	: Right
Latitude	: 23°46'02" N	Longitude	: 74°08'12" E
	Opening Date	Closing Date	
Gauge	: 17-09-1977		
Discharge	: 24-06-1978		
Sediment	: 21-07-1980		
Water Quality	: 01-07-1978		

Water Quality Datasheet for the period : 2015-2016

Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **River Water Analysis** **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	1.744	6.077	391.5	113.5	17.00	5.699	3.351	16.73	16.14	19.59	9.312	6.583
2	Colour_Cod (-)	Clear	Clear	Light Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	495	466	596	530	596	585	530	630	585	536	540	510
4	EC_GEN (µmho/cm)	601	401	405	436	423	425	430	456	478	445	384	377
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	7.7	7.8	8.1	7.9	7.7	8.0	7.1	7.4	8.0	7.2	7.4	7.6
7	pH_GEN (pH units)	8.4	8.1	8.0	8.5	8.5	8.2	8.3	8.1	8.3	8.1	8.4	8.5
8	SS (mg/L)	70	68	83	72	68	34	28	24	30	20	18	18
9	TDS (mg/L)	381	250	258	284	262	268	262	286	302	281	240	240
10	Temp (deg C)	32.0	29.0	28.0	27.0	30.0	28.0	25.0	23.0	24.0	28.0	28.0	30.0
11	Turb (NTU)	10.0	4.0	115.0	6.0	4.0	3.0	7.0	1.0	7.0	1.0	8.0	1.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	11.6	0.0	0.0	4.2	14.1	0.0	0.0	0.0	0.0	0.0	10.0	10.0
2	ALK-TOT (mgCaCO3/L)	163	108	96	128	132	116	128	144	148	140	148	136
3	Ca (mg/L)	46	32	36	33	34	46	52	58	61	57	57	54
4	Cl (mg/L)	54.0	28.0	34.0	30.0	32.0	36.0	30.0	36.0	32.0	34.0	26.0	28.0
5	CO3 (mg/L)	14.0	0.0	0.0	5.0	17.0	0.0	0.0	0.0	0.0	0.0	12.0	12.0
6	F (mg/L)	0.81	1.01	0.57	1.01	0.99	0.93	0.97	0.92	0.96	0.83	0.92	0.57
7	Fe (mg/L)	0.4	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
8	HCO3 (mg/L)	171	132	117	146	127	142	156	176	181	171	156	142
9	K (mg/L)	1.0	2.9	0.8	2.5	1.6	1.6	1.7	1.8	1.9	1.8	2.2	1.6
10	Mg (mg/L)	19.2	14.6	11.4	18.5	20.9	9.0	12.2	12.9	10.9	12.4	12.4	11.7
11	Na (mg/L)	38.3	17.5	24.8	18.5	20.6	23.7	21.6	23.7	23.7	24.8	19.6	21.6
12	NH3-N (mg N/L)	0.20	0.23		0.53	0.48	0.45	0.49	0.16	0.26	0.55	0.23	0.09
13	NO2+NO3 (mg N/L)	0.31	0.38	2.58	1.59	1.51	0.39	1.50	1.28	1.62	0.73	1.15	1.51
14	NO2-N (mgN/L)	0.01	0.11	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
15	NO3-N (mgN/L)	0.30	0.27	2.56	1.58	1.50	0.38	1.49	1.27	1.61	0.72	1.10	1.50
16	P-Tot (mgP/L)	0.100	0.080	0.090	0.070	0.060	0.070	0.070	0.060	0.070	0.070	0.080	0.060
17	SiO2 (mg/L)	30.4	28.5	23.9	17.0	16.2	28.9	16.6	19.9	27.3	24.3	33.3	38.3
18	SO4 (mg/L)	22.1	19.7	28.8	19.0	19.2	20.1	41.4	40.6	42.0	41.1	42.3	40.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	6.1	3.5	4.3	0.7	1.5	1.2	4.2	3.1	1.7	3.1	3.1	2.3
2	COD (mg/L)	24.8	9.0	38.7	51.2	99.7	35.9	98.0	17.0	14.0	14.0	16.0	10.0
3	DO (mg/L)	6.2	7.6	7.1	5.0	6.8	7.1	9.7	9.6	10.4	8.4	6.6	7.3
4	DO_SAT% (%)	84	99	90	63	90	90	117	112	123	107	84	96
5	FCol-MPN (MPN/100mL)	330	2200	21000	210	120	250	140	170	20	80	400	170
6	Tcol-MPN (MPN/100mL)	79000	9400	33000	340	430	590	240	300	45	500	2400	330
	TRACE & TOXIC												
1	Al (mg/L)	0.04	0.03	0.05	0.04	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.03
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	116	80	90	82	86	114	130	145	153	143	141	134
2	HAR_Total (mgCaCO3/L)	196	141	138	159	173	152	181	199	199	195	193	183
3	Na% (%)	30	21	28	20	20	25	21	20	20	22	18	20
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	1.2	0.6	0.9	0.6	0.7	0.8	0.7	0.7	0.7	0.8	0.6	0.7
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Mahi at Padardibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub Divi. : Mahi Sub Div., Kadana**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																					
				01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-	R I V E R D R Y	R I V E R D R Y	-	0.67	3.01	4.34	1.09	13.86	3.38	0.93	0.68	2.26	0.77	-	-	1.450	2.80	1.55	2.681	2.07
2	Cd	Cadmium	microgram / l	0.0	6.00	0.60			0	0.065	0.07	0.33	1.26	0.15	0.09	3.56	0.983	0.00	0.060	0.06	0.31	1.00	0.13	0.07	0.00	0.29
3	Cr	Chromium	microgram / l	0.0	51.00	0			0	3.36	6.95	0	30.94	8.69	2.74	2.47	0.99	0.00	1.24	21.94	0.44	0.00	0.08	1.07	0.00	1.61
4	Cu	Copper	microgram / l	-	-	-			-	6.44	6.60	-	94.00	9.40	3.56	-	1.99	-	-	6.60	8.58	-	0.66	0.78	-	3.46
5	Hg	Mercury	microgram / l	-	1.088	0			-	0.59	-	0	-	-	0.26	0.257	0.08	0.00	0.00	-	-	0.126	-	-	0.00	-
6	Ni	Nickel	microgram / l	0	0	7.30			0.52	-	4.08	0.11	6.80	4.72	9.52	1.94	6.82	0.00	1.39	0.20	1.01	2.58	0.03	1.11	0.10	0.36
7	Pb	Lead	microgram / l	57	23.00	15.84			29.68	5.85	1.37	22.78	9.68	2.70	2.03	0.00	7.12	0.00	1.84	0.81	4.79	12.00	1.34	0.55	0.00	1.20
8	Zn	Zinc	microgram / l	7	24.00	31.82			23.34	25.80	20.20	18.03	218.0	16.27	3.00	34.5	6.00	2.30	1.00	16.0	9.30	1.00	4.90	2.90	3.86	4.60
b	**Pesticides**		microgram / l																							
1	Aldrin	Aldrin	microgram / l	0.008	0.01	0			0	-	-	0.0094	-	-	-	Pesticides value not reported .	-	Pesticides value not reported .	-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l	0.015	0.01	0			0.116	-	-	0.0816	-	-	-		-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l	0	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	0.016	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l	-	0.02	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l	0.003	0	0.01			0.018	-	-	0.0026	-	-	-		-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l	0.035	0.02	0			0.065	-	-	0.0008	-	-	-		-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l	0.007	0.01	0.01			0.209	-	-	0.6913	-	-	-		-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l	0	0.01	-			-	-	-		-	-	-		-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l	0.021	0.05	-			-	-	-		-	-	-		-		-	-	-	-	-	-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Mahi at Paderdibadi (01 02 13 006) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	2250	1.000	56.93
2	EC_FLD (µmho/cm)	12	630	466	550
3	EC_GEN (µmho/cm)	12	601	377	438
4	pH_FLD (pH units)	12	8.1	7.1	7.6
5	pH_GEN (pH units)	12	8.5	8.0	8.3
6	SS (mg/L)	12	83	18	44
7	TDS (mg/L)	12	381	240	276
8	Temp (deg C)	12	32.0	23.0	27.7
9	Turb (NTU)	12	115.0	1.0	13.9
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	14.1	0.0	4.1
2	ALK-TOT (mgCaCO3/L)	12	163	96	132
3	Ca (mg/L)	12	61	32	47
4	Cl (mg/L)	12	54.0	26.0	33.3
5	CO3 (mg/L)	12	17.0	0.0	5
6	F (mg/L)	12	1.01	0.57	0.87
7	Fe (mg/L)	12	0.5	0.3	0.3
8	HCO3 (mg/L)	12	181	117	151
9	K (mg/L)	12	2.9	0.8	1.8
10	Mg (mg/L)	12	20.9	9.0	13.8
11	Na (mg/L)	12	38.3	17.5	23.2
12	NH3-N (mg N/L)	11	0.55	0.09	0.33
13	NO2+NO3 (mg N/L)	12	2.58	0.31	1.21
14	NO2-N (mgN/L)	12	0.11	0.01	0.02
15	NO3-N (mgN/L)	12	2.56	0.27	1.19
16	P-Tot (mgP/L)	12	0.100	0.060	0.073
17	SiO2 (mg/L)	12	38.3	16.2	25.4
18	SO4 (mg/L)	12	42.3	19.0	31.4
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	6.1	0.7	2.9
2	COD (mg/L)	12	99.7	9.0	35.7
3	DO (mg/L)	12	10.4	5.0	7.6
4	DO_SAT% (%)	12	123	63	96
5	FCol-MPN (MPN/100mL)	12	21000	20	2091
6	Tcol-MPN (MPN/100mL)	12	79000	45	10548
	TRACE & TOXIC				
1	Al (mg/L)	12	0.05	0.03	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	153	80	118
2	HAR_Total (mgCaCO3/L)	12	199	138	176
3	Na% (%)	12	30	18	22
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	1.2	0.6	0.8
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Mahi at Paderdibadi (01 02 13 006) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Mahi | **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	Flood											Winter										Summer										
		Jun - Oct											Nov - Feb										Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																
1	Q (cumec)	29.08	696.5	66.61	14.29	34.32	6.077	218.7	166.6	256.0	160.6	106.0	7.551	13.05	7.068	0.716	10.10	2.605	38.04	10.59	28.12	13.20	10.48	4.263	5.189	3.291	1.535	1.408	1.564	10.16	5.347	8.183	10.48	11.83
2	EC_FLD (µmho/cm)	514	467	516	456	425	405	520	427	522	542	537	684	618	536	553	515	516	693	549	567	576	583	587	557	496	556	572	578	497	519	527	489	529
3	EC_GEN (µmho/cm)	474	439	460	418	422	402	429	419	452	509	453	517	544	487	472	506	440	520	498	554	491	447	521	510	472	437	571	470	432	467	481	485	402
4	pH_FLD (pH units)	8.4	8.5	8.9	8.6	8.6	8.4	9.1	7.7	7.4	7.8	7.8	8.1	8.6	8.8	8.8	8.3	8.9	9.7	7.6	8.1	7.9	7.6	8.3	8.8	9.0	8.9	7.9	8.4	8.9	7.7	8.0	7.9	7.4
5	pH_GEN (pH units)	8.2	7.7	8.3	8.2	8.1	7.9	7.6	8.0	8.2	8.3	8.3	8.1	8.3	8.4	8.1	8.0	8.3	8.0	8.4	8.4	8.4	8.2	8.1	8.4	8.5	8.1	7.7	7.9	8.4	8.5	8.4	8.4	8.3
6	SS (mg/L)	45	56	24	24	27	43	47	41	39	57	72	18	25	20	24	25	35	35	45	49	71	29	21	23	15	20	28	41	48	36	25	68	19
7	TDS (mg/L)	315	287	300	264	275	257	271	265	292	327	287	334	343	312	292	319	266	331	305	349	309	280	339	313	291	272	366	296	268	290	307	305	254
8	Temp (deg C)	30.6	29.3	30.1	28.4	29.1	24.7	25.2	23.3	27.4	28.3	29.2	21.7	23.5	21.8	23.0	26.3	20.5	24.3	22.6	21.8	19.3	25.0	27.3	28.4	26.1	23.5	25.0	22.0	28.1	28.6	27.7	24.7	28.7
9	Turb (NTU)	2.2	103.6	69.0	77.0	12.0	9.3	84.3	76.7	19.2	36.4	27.8	8.0	9.3	1.3	2.0	2.0	7.0	6.3	4.3	12.3	6.0	4.5	7.3	3.7	2.0	2.0	3.0	4.0	4.0	3.0	5.3	4.0	3.3
	CHEMICAL																																
1	Alk-Phen (mgCaCO3/L)	1.0	0.0	1.5	1.9	0.0	0.0	0.0	0.0	0.3	6.3	6.0	0.0	1.2	5.0	0.0	0.4	0.4	2.1	2.9	7.9	4.6	0.0	0.6	3.3	2.8	0.0	0.0	0.0	0.6	1.7	8.3	9.4	6.6
2	ALK-TOT (mgCaCO3/L)	194	212	222	188	131	132	131	144	155	162	126	237	246	246	233	167	127	185	168	181	162	134	240	231	211	216	196	144	151	171	170	146	141
3	Ca (mg/L)	32	35	38	36	42	44	45	50	49	52	36	37	36	44	42	55	45	69	60	62	56	54	38	37	40	40	63	50	52	60	58	47	56
4	Cl (mg/L)	35.2	32.8	47.2	34.0	54.7	46.0	34.0	30.7	39.2	39.6	35.6	40.0	54.5	43.0	36.0	61.0	48.0	40.0	32.5	42.5	41.5	33.5	44.0	58.7	36.0	34.0	66.0	47.0	35.3	39.3	38.7	40.0	29.3
5	CO3 (mg/L)	1.2	0.0	1.8	2.3	0.0	0.0	0.0	0.0	0.4	7.6	7.2	0.0	1.5	6.0	0.0	0.5	0.5	2.5	3.5	9.5	5.5	0.0	0.7	4.0	3.3	0.0	0.0	0.0	0.7	2.0	10.0	11.3	8.0
6	F (mg/L)	0.29	0.41	0.72	0.78	0.87	0.51	0.77	0.61	0.75	0.57	0.88	0.26	0.72	0.67	0.34	0.75	0.53	0.66	0.53	0.69	0.47	0.95	0.29	0.78	0.62	0.33	0.67	0.83	0.61	0.80	0.74	0.68	0.77
7	Fe (mg/L)	0.0	0.1	0.1	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.3	0.0	0.0	0.1	0.2	0.4	0.6	0.6	0.6	0.6	0.5	0.3	0.0	0.0	0.1	0.2	0.4	0.7	0.6	0.5	0.6	0.5	0.3
8	HCO3 (mg/L)	117	129	134	112	159	161	159	176	188	182	139	145	149	144	142	202	154	221	198	201	187	164	146	137	125	132	239	176	182	205	187	155	156
9	K (mg/L)	1.2	1.9	0.7	1.2	1.2	0.7	0.8	0.8	0.9	0.8	1.8	1.6	1.1	0.5	1.2	1.1	1.4	0.8	0.8	0.9	0.9	1.8	1.3	0.7	0.8	0.7	0.9	2.0	0.7	0.8	0.7	0.9	1.9
10	Mg (mg/L)	6.7	8.4	9.1	6.8	9.1	8.4	9.4	10.0	12.4	13.0	16.9	9.7	11.4	10.7	6.8	11.9	8.0	8.5	9.7	11.7	13.1	11.2	9.5	9.6	10.7	5.8	14.6	10.2	11.0	11.3	12.3	12.8	12.1
11	Na (mg/L)	24.8	24.6	35.9	21.8	40.3	33.7	23.8	20.9	27.7	26.2	23.9	29.1	41.8	31.6	27.8	46.9	36.2	27.6	22.9	28.4	27.6	23.2	32.7	45.1	24.5	24.3	48.3	35.2	23.4	24.1	27.5	28.6	22.0
12	NH3-N (mg N/L)		0.20	0.05	0.39	0.41	0.23	0.49	0.45	0.41	0.33	0.36	0.09		0.06	0.32	0.08	0.29	0.35	0.29	0.38	0.36	0.34	0.09		0.12	0.29	0.12	0.40	0.22	0.46	0.73	0.25	0.29
13	NO2+NO3 (mg N/L)	0.19	1.16	0.75	0.55	0.42	0.46	1.81	1.62	1.70	1.15	1.27	0.57	0.25	1.41	0.84	0.55	0.57	2.30	2.12	1.41	0.92	1.20	0.29	0.19	0.60	0.77	0.84	0.80	0.72	1.13	1.80	0.45	1.13
14	NO2-N (mgN/L)	0.04	0.05	0.03	0.04	0.09	0.03	0.02	0.05	0.02	0.04	0.03	0.00	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.04	0.01	0.01	0.01	0.02	0.01	0.02	0.03	0.04	0.02	0.02
15	NO3-N (mgN/L)	0.14	1.11	0.72	0.50	0.33	0.42	1.79	1.58	1.67	1.11	1.24	0.57	0.22	1.39	0.83	0.53	0.55	2.29	2.10	1.39	0.91	1.19	0.25	0.17	0.59	0.76	0.82	0.79	0.70	1.10	1.76	0.44	1.11
16	P-Tot (mgP/L)	0.012	0.036	0.020	0.090	0.110	0.100	0.097	0.090	0.098	0.088	0.080	0.047	0.020	0.020	0.070	0.120	0.098	0.105	0.095	0.103	0.100	0.067	0.043	0.010	0.020	0.070	0.130	0.100	0.107	0.090	0.097	0.100	0.070
17	SiO2 (mg/L)	12.1	24.5	28.5	29.9	26.2	32.1	30.2	31.4	29.0	32.8	23.2	19.1	26.8	26.7	20.5	24.8	30.5	29.4	32.0	20.9	24.8	23.2	20.2	29.6	23.1	20.9	22.2	21.5	9.0	28.2	20.8	19.9	32.0
18	SO4 (mg/L)	10.1	12.8	21.9	13.7	15.1	15.8	10.8	10.3	11.0	10.6	21.8	18.2	18.4	23.2	11.0	20.3	20.6	12.8	11.6	11.8	16.1	36.0	20.1	19.8	23.1	10.2	20.9	21.4	14.2	11.6	12.1	17.5	41.1
	BIOLOGICAL/BACTERIOLOGICAL																																
1	BOD3-27 (mg/L)	0.6	0.8	1.4	2.5	2.2	2.5	1.7	1.8	2.0	2.6	3.2	0.7	1.5	1.7	1.6	1.7	1.5	1.5	0.9	1.6	5.4	2.5	0.6	1.9	2.7	2.5	2.3	2.0	1.9	1.7	2.7	4.7	2.8
2	COD (mg/L)										72.8	44.7									126.5	29.7	41.2									45.8	62.4	13.3
3	DO (mg/L)	6.1	6.1	7.2	9.6	8.0	7.7	8.0	6.7	7.7	6.4	6.5	7.7	8.6	10.4	9.8	8.8	8.8	9.3	8.9	9.0	10.4	9.2	7.2	8.8	8.8	8.1	7.9	8.9	8.1	7.4	8.4	7.3	7.4
4	DO_SAT% (%)	81	79	95	122	105	92	96	79	97	82	85	87	101	116	114	109	98	110	103	102	111	111	90	113	109	95	96	101	101	94	107	88	96
5	FCol-MPN (MPN/100mL)										2800	4772									100	2475	145									933	1464	217
6	Tcol-MPN (MPN/100mL)										24360	24434									12409	22475	294									25001	2733	1077
	TRACE & TOXIC																																
1	Al (mg/L)	0.01	0.05	0.04	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.04	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.04	0.03	0.03	0.03	0.04	0.04
	CHEMICAL INDICES																																
1	HAR_Ca (mgCaCO3/L)	81	87	94	91	106	111	112	124	123	131	91	93	90	111	104	137	113	172	149	155	139	136	96	93	99	100	156	124	131	151	144	118	140
2	HAR_Total (mgCaCO3/L)	109	122	132	119	143	146	151	166	174	185	161	133	137	156	133	187	147	208	190	204	194	183	135	133	143	124	217	167	177	198	196	171	190
3	Na% (%)	32	28	37	28	38	33	26	21	25	22	24	32	40	31	31	35	35	22	21	23	24	22	34	42	27	30	33	31	22	21	24	27	20
4	SAR (-)	1.0	0.9	1.4	0.9	1.5	1.2	0.8	0.7	0.9	0.8	0.8	1.1	1.6	1.1	1.1	1.5	1.3	0.8	0.7	0.9	0.9	0.8	1.2	1.7	0.9	0.9	1.4	1.2	0.8	0.7	0.9	1.0	0.7
	PESTICIDES																																

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Mahi at Khanpur**	**Code**	**: 01 02 13 012**
State	: Gujarat	District	Anand
Basin	: Mahi	Independent River	: Mahi
Tributary	: Mahi	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Mahi
Division	: Mahi Division, Gandhinagar	Sub-Division	: Mahi Sub Divn., Kadana
Drainage Area	: 32510 Sq. Km.	Bank	: Right
Latitude	: 22°31'55" N	Longitude	: 73°08'27" E

	Opening Date	Closing Date
Gauge	: 21-12-1978	
Discharge	: 21-12-1978	
Sediment	: 01-05-1988	
Water Quality	: 01-01-1979	

Mahi at Khanpur

Water Quality Datasheet for the period : 2015-2016

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **River Water Analysis** **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	11.98	42.22	1087	24.62	30.19	17.02	16.95	17.20	16.91	14.57	17.36	12.34
2	Colour_Cod (-)	Clear	Clear	Light Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)			410	380	410	361	418	436	453	500	465	436
4	EC_GEN (µmho/cm)	448	366	255	338	376	350	370	394	376	391	384	403
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)					8.8	7.5	8.9	9.0	9.0	8.8	8.9	9.0
7	pH_GEN (pH units)	8.8	8.2	8.1	8.7	8.7	8.5	8.6	8.4	8.5	8.5	8.6	8.7
8	SS (mg/L)	46	90	88	94	66	44	40	36	44	30	28	33
9	TDS (mg/L)	283	232	156	220	246	211	236	244	242	237	247	248
10	Temp (deg C)	32.0	31.0	28.0	30.0	31.0	28.0	26.0	22.0	23.0	25.0	29.0	31.0
11	Turb (NTU)	4.0	6.0	116.0	5.0	4.0	3.0	2.0	1.0	1.0	1.0	4.0	2.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	15.8	0.0	0.0	5.8	11.6	5.8	10.0	8.3	5.8	8.3	10.0	8.3
2	ALK-TOT (mgCaCO3/L)	148	102	88	103	115	112	124	145	128	149	132	157
3	Ca (mg/L)	42	30	31	34	36	40	45	50	49	52	44	59
4	Cl (mg/L)	40.0	26.0	18.0	24.0	30.0	26.0	26.0	30.0	28.0	28.0	28.0	32.0
5	CO3 (mg/L)	19.0	0.0	0.0	7.0	14.0	7.0	12.0	10.0	7.0	10.0	12.0	10.0
6	F (mg/L)	0.44	0.57	0.11	0.57	0.53	0.62	0.56	0.80	0.43	0.68	0.80	0.59
7	Fe (mg/L)	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
8	HCO3 (mg/L)	142	124	107	112	112	122	127	156	142	161	137	171
9	K (mg/L)	0.7	2.5	0.7	1.8	1.9	1.4	1.8	1.6	1.0	1.3	1.4	1.4
10	Mg (mg/L)	20.2	11.7	7.8	10.2	12.4	8.3	10.2	11.7	8.5	10.2	10.7	9.2
11	Na (mg/L)	25.8	19.6	11.2	17.5	19.6	17.5	17.5	19.6	18.5	19.6	19.6	21.6
12	NH3-N (mg N/L)		0.15	0.88	0.85	0.88	0.21	0.89	0.22	0.09	0.45	0.28	0.09
13	NO2+NO3 (mg N/L)	0.92	0.15	2.29	2.31	2.35	1.87	2.32	1.57	1.31	1.17	0.88	0.73
14	NO2-N (mgN/L)	0.02	0.01	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02
15	NO3-N (mgN/L)	0.90	0.14	2.26	2.29	2.33	1.86	2.31	1.56	1.30	1.16	0.87	0.71
16	P-Tot (mgP/L)	0.060	0.050	0.050	0.050	0.060	0.050	0.060	0.070	0.060	0.060	0.070	0.060
17	SiO2 (mg/L)	28.6	21.9	29.6	25.0	25.1	25.0	24.8	22.9	25.7	26.0	31.1	35.4
18	SO4 (mg/L)	23.8	18.7	9.6	12.1	12.7	13.5	12.9	13.7	13.3	13.7	14.1	14.1
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	3.9	2.1	3.3	1.3	0.7	0.9	1.1	1.0	0.9	2.3	2.5	3.2
2	COD (mg/L)	80.3	8.0	7.0	19.7	119.6	31.9	2.0	14.0	5.0	11.0	19.0	7.0
3	DO (mg/L)	8.3	6.3	6.6	6.9	6.8	8.0	8.4	9.0	8.6	8.2	8.4	9.0
4	DO_SAT% (%)	113	84	84	91	92	102	104	102	100	99	109	121
5	FCol-MPN (MPN/100mL)	460	3100	17000	260	110	270	2	2	20	170	20	20
6	Tcol-MPN (MPN/100mL)	94000	8400	41000	630	540	610	270	80	130	500	40	78
	TRACE & TOXIC												
1	Al (mg/L)	0.03	0.02	0.02	0.03	0.04	0.03	0.04	0.05	0.04	0.03	0.05	0.03
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	104	76	77	84	89	100	112	124	122	130	110	148
2	HAR_Total (mgCaCO3/L)	188	125	110	127	141	135	155	173	158	173	155	187
3	Na% (%)	23	25	18	23	23	22	20	20	20	20	21	20
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	0.8	0.8	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub Divi. : Mahi Sub Div., Kadana**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																						
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-	-	1.977	-	0.43	2.65	0.86	1.65	11.65	3.38	0.27	2.38	1.27	4.66	-	-	1.674	1.65	2.40	2.268	0.64
2	Cd	Cadmium	microgram / l	0.0	5.00	0.60	1.97	0.00	0	0.037	0.14	0.09	0.12	0.17	0.19	3.26	1.09	0.00	0.03	0.11	1.05	1.00	0.10	0.01	0.00	0.28
3	Cr	Chromium	microgram / l	0.0	0.00	0	0	0	0.36	2.8	9.02	0	10.36	20.16	2.56	2.02	0.02	0.00	1.34	13.07	5.6	0.00	0.23	81.70	0.00	1.65
4	Cu	Copper	microgram / l	-	-	-	-	-	-	9.79	47.64	-	27.6	6.19	2.34	-	3.33	-	4.86	13.50	10.33	-	1.42	2.08	-	4.29
5	Hg	Mercury	microgram / l	-	6.284	0	0	0	-	0.57	-	0	-	-	0.24	0.377	0.14	0.029	-	-	-	0.111	-	-	0.00	-
6	Ni	Nickel	microgram / l	0	0	7.60	0.00	0.00	0.39	-	9.74	0	7.2	9.39	7.06	1.83	8.25	0.00	1.04	0.01	0.58	1.79	0.73	19.83	0.00	1.26
7	Pb	Lead	microgram / l	46.0	39.00	13.48	23.00	0.00	28.53	4.04	0.88	21.7	5.07	1.01	2.11	0.00	2.98	0.00	0.31	0.44	4.87	10.00	0.74	0.37	0.00	1.23
8	Zn	Zinc	microgram / l	6.00	29.00	23.26	5.57	7.81	5.70	13.88	0.00	18.13	19.00	10.14	2.80	18.23	8.00	26.2	2.00	13.0	9.20	0.00	7.70	8.20	0.00	3.70
b	Pesticides		microgram / l																							
1	Aldrin	Aldrin	microgram / l	0	0.01	0	0	0	0	-	-	0.0016	-	-	-	Pesticides value not reported.	-	Pesticides value not reported.	-	-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l	0	0.01	0.01	0.0029	0.0077	0	-	-	0.0201	-	-	-		-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l	0	0.01	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	0	0	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l	-	0.01	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l	0	0	0.01	0.0008	0	0	-	-	0	-	-	-		-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l	0.012	0.01	0	0.0009	0.0025	0	-	-	0.0001	-	-	-		-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l	0	0.01	0.01	0.0021	0.0118	0.093	-	-	0.037	-	-	-		-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l	0	0	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l	0.009	0.03	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Mahi at Khanpur (01 02 13 012) **Division : Mahi Division, Gandhinagar**

Local River : Mahi **Sub-Division : Mahi Sub Divn., Kadana**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	7091	9.970	85.02
2	EC_FLD (µmho/cm)	10	500	361	427
3	EC_GEN (µmho/cm)	12	448	255	371
4	pH_FLD (pH units)	8	9.0	7.5	8.7
5	pH_GEN (pH units)	12	8.8	8.1	8.5
6	SS (mg/L)	12	94	28	53
7	TDS (mg/L)	12	283	156	234
8	Temp (deg C)	12	32.0	22.0	28
9	Turb (NTU)	12	116.0	1.0	12.4
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	15.8	0.0	7.5
2	ALK-TOT (mgCaCO3/L)	12	157	88	125
3	Ca (mg/L)	12	59	30	43
4	Cl (mg/L)	12	40.0	18.0	28
5	CO3 (mg/L)	12	19.0	0.0	9
6	F (mg/L)	12	0.80	0.11	0.56
7	Fe (mg/L)	12	0.3	0.1	0.2
8	HCO3 (mg/L)	12	171	107	134
9	K (mg/L)	12	2.5	0.7	1.5
10	Mg (mg/L)	12	20.2	7.8	10.9
11	Na (mg/L)	12	25.8	11.2	18.9
12	NH3-N (mg N/L)	11	0.89	0.09	0.45
13	NO2+NO3 (mg N/L)	12	2.35	0.15	1.49
14	NO2-N (mgN/L)	12	0.03	0.01	0.01
15	NO3-N (mgN/L)	12	2.33	0.14	1.47
16	P-Tot (mgP/L)	12	0.070	0.050	0.058
17	SiO2 (mg/L)	12	35.4	21.9	26.8
18	SO4 (mg/L)	12	23.8	9.6	14.3
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	3.9	0.7	1.9
2	COD (mg/L)	12	119.6	2.0	27
3	DO (mg/L)	12	9.0	6.3	7.9
4	DO_SAT% (%)	12	121	84	100
5	FCol-MPN (MPN/100mL)	12	17000	2	1786
6	Tcol-MPN (MPN/100mL)	12	94000	40	12190
	TRACE & TOXIC				
1	Al (mg/L)	12	0.05	0.02	0.03
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	148	76	107
2	HAR_Total (mgCaCO3/L)	12	188	110	152
3	Na% (%)	12	25	18	21
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	0.8	0.5	0.7
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Mahi at Khanpur (01 02 13 012) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Mahi | **Sub-Division : Mahi Sub Divn., Kadana**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	387.7	452.2	244.1	23.86	53.32	54.34	329.0	122.7	1522	73.26	239.2	40.42	38.04	27.17	22.61	9.746	9.095	17.35	21.07	48.81	27.02	17.02	23.31	29.13	23.65	21.10	8.619	8.282	7.026	10.87	26.16	20.88	14.76
2	EC_FLD (µmho/cm)	610	453	391	402	376	577	402	413	420	430	400	484	482	400	410	440	386	474	364	367	407	417	410	451	415	412	585	377	480	482	482	479	467
3	EC_GEN (µmho/cm)	375	367	328	476	481	533	467	435	367	424	357	587	465	505	536	665	593	492	454	470	479	373	410	436	454	555	577	577	428	444	430	443	393
4	pH_FLD (pH units)	8.0	8.0	8.2	8.0	7.8	7.7	7.3	6.8	6.8	7.0	8.8	8.3	8.2	8.1	7.8	7.4	8.1	7.2	7.5	7.2	6.9	8.6	8.5	8.5	8.1	7.9	7.7	6.9	7.3	8.3	8.3	7.2	8.9
5	pH_GEN (pH units)	8.1	7.9	8.2	8.3	8.0	7.8	7.6	8.5	8.3	8.5	8.5	8.2	8.4	8.3	8.0	7.9	8.3	7.9	8.5	8.4	8.5	8.5	8.4	8.5	8.5	8.0	7.9	7.7	8.8	8.7	8.5	8.7	8.6
6	SS (mg/L)	50	39	21	16	30	40	52	44	116	40	77	27	17	25	24	24	28	46	47	41	55	41	16	29	22	36	32	35	48	52	19	52	30
7	TDS (mg/L)	245	230	205	312	307	331	297	278	235	266	227	380	288	325	335	420	382	308	275	300	307	233	271	278	293	351	368	365	281	275	278	277	244
8	Temp (deg C)	28.1	29.4	29.2	29.1	29.6	28.4	16.7	30.5	29.2	30.6	30.4	22.8	24.9	22.1	21.4	22.1	21.2	18.5	22.3	22.8	22.4	24.8	26.8	27.8	25.5	24.8	26.2	19.2	28.0	28.0	26.8	26.3	28.3
9	Turb (NTU)	1.8	59.0	36.8	8.8	2.4	80.0	8.2	4.4	63.6	6.4	27.0	5.8	7.8	4.5	1.5	1.5	5.0	3.3	4.8	4.3	3.0	1.8	5.3	6.3	1.7	1.3	2.0	3.7	2.0	2.7	3.0	4.0	2.3
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	1.2	0.0	1.5	3.3	0.0	0.0	0.0	3.2	1.2	10.3	6.6	0.4	3.5	1.5	1.0	0.0	1.5	0.0	7.5	5.8	10.4	7.5	0.8	5.8	3.9	0.0	0.0	0.0	6.6	4.7	7.5	12.7	8.9
2	ALK-TOT (mgCaCO3/L)	184	192	174	207	178	159	134	145	134	151	111	232	192	275	254	198	166	166	154	158	167	127	203	212	226	259	179	156	156	173	156	150	146
3	Ca (mg/L)	31	32	29	39	41	53	47	53	45	49	34	36	32	46	44	59	60	68	55	57	55	46	33	33	37	46	60	51	57	60	53	41	52
4	Cl (mg/L)	27.5	25.5	34.8	38.8	55.2	52.0	48.4	34.4	26.8	29.6	27.6	40.5	39.3	45.5	41.5	77.5	78.5	38.0	36.5	35.0	40.0	27.5	29.3	50.9	38.7	53.3	66.7	76.0	32.7	36.0	34.0	34.0	29.3
5	CO3 (mg/L)	1.5	0.0	1.8	4.0	0.0	0.0	0.0	3.8	1.4	12.4	8.0	0.5	4.3	1.8	1.3	0.0	1.8	0.0	9.0	7.0	12.5	9.0	1.0	7.0	4.7	0.0	0.0	0.0	8.0	5.7	9.0	15.3	10.7
6	F (mg/L)	0.26	0.33	0.50	0.83	0.43	0.50	0.59	0.63	0.55	0.52	0.44	0.30	0.56	0.52	0.46	0.63	0.49	0.41	0.50	0.59	0.47	0.60	0.25	0.69	0.58	0.42	0.65	0.60	0.51	0.79	0.63	0.51	0.69
7	Fe (mg/L)	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.0	0.0	0.1	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2
8	HCO3 (mg/L)	111	117	104	122	151	194	164	169	161	159	119	141	113	166	154	242	199	203	170	178	178	137	123	122	133	158	218	190	174	200	172	151	156
9	K (mg/L)	1.0	0.7	0.5	1.0	1.1	0.9	1.1	0.7	0.7	0.8	1.5	1.8	0.7	0.5	1.6	1.2	1.3	0.8	0.7	0.9	0.9	1.5	1.0	0.6	1.0	0.8	0.9	1.6	0.6	0.7	0.9	0.8	1.3
10	Mg (mg/L)	5.8	8.1	8.2	7.4	10.3	11.9	9.5	9.1	11.5	12.1	12.4	9.1	7.7	10.5	9.2	16.3	11.2	7.5	9.7	10.2	18.2	9.7	8.0	8.8	9.7	10.7	11.0	11.7	9.4	11.7	11.7	17.7	10.0
11	Na (mg/L)	20.0	19.0	25.6	28.1	38.6	39.3	33.4	22.9	18.1	19.8	18.7	29.3	29.5	33.2	30.7	59.1	57.9	26.8	24.5	25.3	25.5	18.2	19.3	39.2	26.6	35.5	49.5	57.2	22.3	24.1	25.1	24.8	20.2
12	NH3-N (mg N/L)		0.05	0.05	0.71	0.31	0.15	0.20	0.31	0.43	0.46	0.69	0.07		0.07	0.18	0.15	0.30	0.38	0.28	0.49	0.14	0.35	0.05	0.06	0.17	0.29	0.14	0.19	0.44	0.16	0.49	0.30	0.27
13	NO2+NO3 (mg N/L)	0.16	1.12	1.01	1.37	1.24	1.18	1.32	1.52	2.41	1.39	1.60	0.13	1.17	1.95	1.03	0.95	2.51	4.05	1.73	2.52	2.89	1.77	0.04	1.11	1.15	0.91	0.80	1.25	2.12	1.58	2.78	1.27	0.93
14	NO2-N (mgN/L)	0.02	0.03	0.04	0.04	0.02	0.08	0.01	0.02	0.03	0.03	0.02	0.02	0.02	0.08	0.02	0.05	0.02	0.04	0.03	0.04	0.02	0.01	0.00	0.02	0.03	0.03	0.03	0.04	0.05	0.03	0.06	0.02	0.01
15	NO3-N (mgN/L)	0.14	1.09	0.97	1.33	1.22	1.09	1.30	1.50	2.38	1.36	1.58	0.11	1.16	1.88	1.01	0.90	2.50	4.01	1.70	2.48	2.86	1.76	0.04	1.08	1.12	0.88	0.77	1.22	2.07	1.55	2.72	1.25	0.91
16	P-Tot (mgP/L)	0.010	0.022	0.014	0.026	0.044	0.064	0.050	0.064	0.054	0.064	0.054	0.027	0.017	0.025	0.040	0.088	0.063	0.070	0.060	0.063	0.070	0.060	0.013	0.037	0.023	0.043	0.080	0.063	0.067	0.057	0.067	0.060	0.063
17	SiO2 (mg/L)	11.7	19.4	25.8	33.6	33.7	34.2	33.7	29.4	31.0	26.2	26.0	18.7	21.6	26.1	24.1	33.9	30.7	32.4	28.6	28.3	31.3	24.6	19.3	30.1	23.4	26.4	28.2	31.9	13.4	33.2	26.6	22.8	30.8
18	SO4 (mg/L)	9.7	13.8	15.7	18.5	17.9	20.7	18.5	15.7	13.1	12.0	15.4	14.5	13.8	13.4	19.4	21.7	22.9	16.4	15.5	15.2	18.3	13.3	11.2	16.3	13.6	18.8	21.9	23.4	16.8	15.1	15.4	17.4	13.9
	BIOLOGICAL/BACTERIOLOGICAL																																	
1	BOD3-27 (mg/L)	0.2	1.0	1.9	1.5	1.6	2.3	1.8	1.3	0.8	1.5	2.2	0.6	1.1	1.9	1.4	1.4	1.6	1.2	1.1	1.7	2.5	1.0	0.4	1.6	1.5	1.1	2.0	1.8	1.3	1.5	2.1	1.0	2.7
2	COD (mg/L)										53.2	46.9									118.2	34.6	13.2									26.6	33.1	12.3
3	DO (mg/L)	6.3	7.6	7.2	6.8	6.5	5.9	6.8	7.4	6.8	6.9	7.0	7.1	8.9	9.5	7.7	7.0	6.6	8.7	10.0	9.5	9.9	8.5	7.3	8.5	8.4	5.1	5.9	5.9	9.4	7.6	9.0	7.3	8.5
4	DO_SAT% (%)	79	99	94	89	85	76	70	99	88	92	93	82	107	108	87	80	75	92	113	110	113	102	90	107	101	61	73	63	120	97	111	90	110
5	FCol-MPN (MPN/100mL)										3565	4186									94	2610	73									1400	297	70
6	Tcol-MPN (MPN/100mL)										37900	28914									11530	26875	273									24634	1177	206
	TRACE & TOXIC																																	
1	Al (mg/L)	0.02	0.03	0.04	0.02	0.03	0.03	0.02	0.03	0.02	0.04	0.03	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.02	0.04	0.53	0.04	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.05	0.03	0.04
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	78	79	73	99	103	131	118	131	111	122	86	89	80	116	109	148	149	169	136	142	136	115	83	84	94	116	151	128	143	150	134	103	130
2	HAR_Total (mgCaCO3/L)	102	113	107	129	146	181	158	170	159	172	138	127	112	160	148	216	196	201	177	185	212	155	116	120	134	161	197	177	182	198	182	177	171
3	Na% (%)	29	27	34	32	36	32	30	22	19	20	22	32	36	31	31	37	39	22	23	23	21	20	26	41	30	32	35	41	21	21	23	23	20
4	SAR (-)	0.9	0.8	1.1	1.1	1.4	1.3	1.1	0.8	0.6	0.7	0.7	1.1	1.2	1.1	1.1	1.8	1.8	0.8	0.8	0.8	0.8	0.6	0.8	1.6	1.0	1.2	1.5	1.9	0.7	0.7	0.8	0.8	0.7
	PESTICIDES																																	

3. SABARMATI BASIN

3.0 Sabarmati Basin

3.1 Basin description

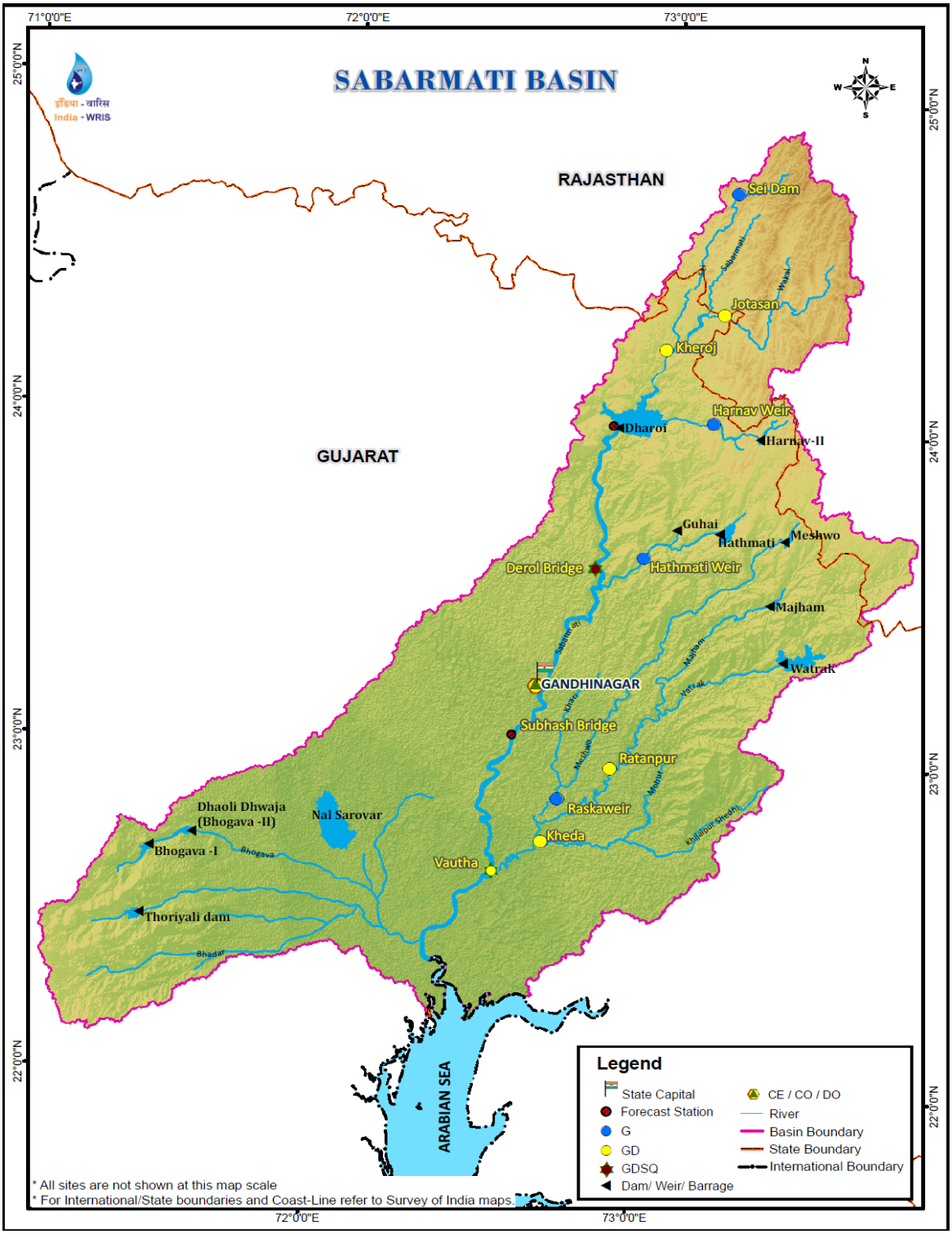
The Sabarmati is one of the major west flowing interstate rivers in India. Its basin map is enclosed. It originates in the foothills of Aravalli range at an elevation of 762 m above mean sea level. It traverses a length of 371 km in southwest direction. It flows initially in Rajasthan for about 48 km and enters Gujarat where it flows for 323 km to join Gulf of Cambay in the Arabian sea. The river drains an area of 21,674 sq.km. The basin is triangular in shape with the main river as the base and Watrak as the apex point. The basin lies in between 72^0 20' and 73^0 30' east longitudes and 20^0 and 25^0 north latitudes

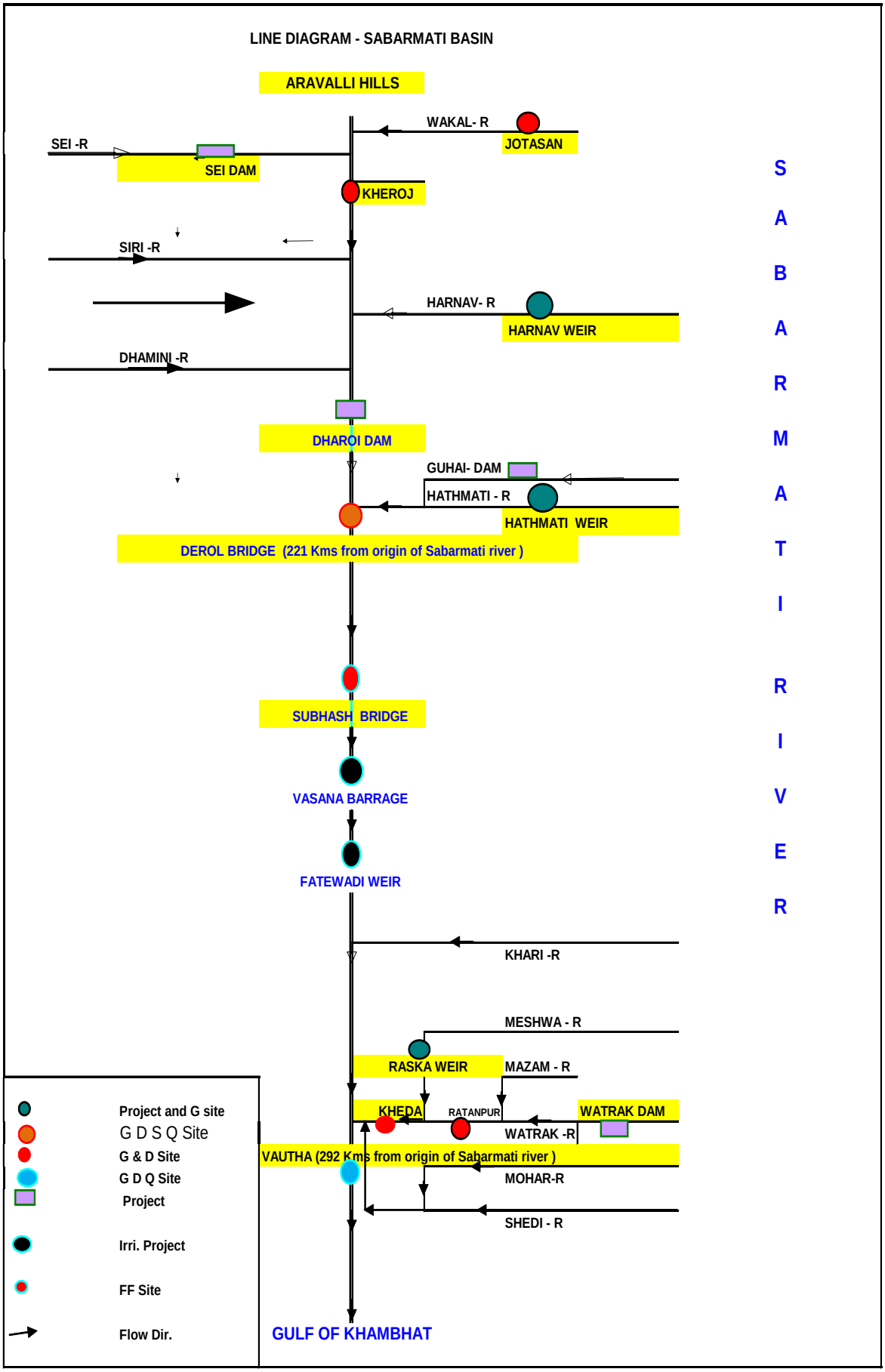
The important tributaries are Sai, Wakal, Harnav, Hathmati and Watrak. The left bank tributary Wakal joins the river at 51 km of its run from the origin. It receives the Sai, a major right bank tributary near Mahuri and then Harnav on the left bank at about 103 km. Below this confluence, the Sabarmati flows through the Dharoi gorge. Emerging from the gorge, it passes through the plains. Two major tributaries viz. Hathmati and Watrak joins on the left bank of main stream at a distance of 170 km and 235 km respectively from the origin

The average annual rainfall in the Sabarmati basin is about 787 mm. The climate varies widely. In winter, the minimum temperature generally varies from 9^0C to 14^0C. However, lower temperatures have also been recorded in several areas. The maximum temperature in the basin varies from 40^0C to 48^0C.

At present, there are 13 major/medium irrigation schemes. However, Dharoi Dam and Watrak project have 80 percent of the storage capacity of all the projects of the basin.

Dharoi Dam is located at Dharoi village, which is about 70km from Mehsana. In the Gujarat State the direct benefits of this project are water supply to Ahmedabad city and providing irrigation facilities. There is provision for 1.4 MW hydropower generations also.


SABARMATI BASIN
इंडिया - वारिस
India - WRIS
RAJASTHAN
GUJARAT
ARABIAN SEA
Sei Dam
Jotasan
Kheroj
Harnav Weir
Dharoi
Harnav-II
Guhai
Hathmati
Meshwo
Derol Bridge
Hathmati Weir
Majham
Watrak
GANDHINAGAR
Subhash Bridge
Ratanpur
Raskaweir
Kheda
Vautha
Dhaoli Dhwaja
(Bhogava -II)
Nal Sarovar
Bhogava -I
Thoriyali dam
Legend
State Capital
Forecast Station
G
GD
GDSQ
Dam/ Weir/ Barrage
CE / CO / DO
River
Basin Boundary
State Boundary
International Boundary
* All sites are not shown at this map scale
* For International/State boundaries and Coast-Line refer to Survey of India maps
71°0'0"E
72°0'0"E
73°0'0"E
25°0'0"N
24°0'0"N
23°0'0"N
22°0'0"N


LINE DIAGRAM - SABARMATI BASIN
ARAVALLI HILLS
WAKAL- R
JOTASAN
SEI -R
SEI DAM
KHEROJ
SIRI -R
HARNAV- R
HARNAV WEIR
DHAMINI -R
DHAROI DAM
GUHAI- DAM
HATHMATI - R
HATHMATI WEIR
DEROL BRIDGE (221 Kms from origin of Sabarmati river)
SUBHASH BRIDGE
VASANA BARRAGE
FATEWADI WEIR
KHARI -R
MESHWA - R
RASKA WEIR
MAZAM - R
KHEDA
RATANPUR
WATRAK DAM
WATRAK -R
VAUTHA (292 Kms from origin of Sabarmati river)
MOHAR-R
SHEDI - R
GULF OF KHAMBHAT
SABARMATI RIVER
Project and G site
G D S Q Site
G & D Site
G D Q Site
Project
Irri. Project
FF Site
Flow Dir.

3.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Sabarmati at Derol Bridge**	**Code**	**: 01 02 12 006**
State	: Gujarat	District	Sabarkantha
Basin	: Sabarmati	Independent River	: Sabarmati
Tributary	: Sabarmati	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Sabarmati
Division	: Mahi Division, Gandhinagar	Sub-Division	: N.W.R.Sub Div., Himatnagar
Drainage Area	: 6724 Sq. Km.	Bank	: Left
Latitude	: 23°34'24" N	Longitude	: 72°48'25" E

	Opening Date	Closing Date
Gauge	: 19-08-1980	
Discharge	: 01-06-1991	
Sediment	: 25-09-1992	
Water Quality	: 15-07-1992	

Sabarmati at Derol Bridge (Dry)

Water Quality Datasheet for the period : 2015-2016

Station Name : Sabarmati at Derol Bridge (01 02 12 006) | **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati | **River Water Analysis** | **Sub-Division : N.W.R.Sub Div., Himatnagar**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	02-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)		0.240	87.37	9.725	1.517	0.370	0.200	0.160	0.000			
2	Colour_Cod (-)			Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			886		882		437		436		437	
4	EC_GEN (µmho/cm)			179		564		530		528		501	
5	Odour_Code (-)			odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			7.4		7.4		7.4		7.4		7.6	
7	pH_GEN (pH units)			8.0		8.3		8.5		8.5		8.5	
8	SS (mg/L)			248		168		83		89		40	
9	TDS (mg/L)			108		366		346		348		325	
10	Temp (deg C)			28.0		29.0		27.0		25.0		29.0	
11	Turb (NTU)			116.0		32.0		1.0		1.0		5.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		11.6		8.3		11.6		5.8	
2	ALK-TOT (mgCaCO3/L)			68		140		133		136		131	
3	Ca (mg/L)			22		35		47		49		43	
4	Cl (mg/L)		O	14.0	O	74.0	O	66.0	O	62.0	O	60.0	O
5	CO3 (mg/L)		N	0.0	N	14.0	N	10.0	N	14.0	N	7.0	N
6	F (mg/L)		C	0.16	C	0.12	C	0.45	C	0.73	C	0.80	C
7	Fe (mg/L)	R	E	0.1	E	0.1	E	0.2	E	0.1	E	0.2	E
8	HCO3 (mg/L)	I		83		142		142		137		146	
9	K (mg/L)	V		0.9		1.1		0.9		0.9		1.3	
10	Mg (mg/L)	E	I	5.1	I	22.4	I	13.4	I	11.2	I	11.7	I
11	Na (mg/L)	R	N	10.2	N	44.5	N	41.4	N	40.4	N	43.5	N
12	NH3-N (mg N/L)			0.59		0.65		0.61		0.19		0.32	
13	NO2+NO3 (mg N/L)		2	2.29	2	2.01	2	2.57	2	1.14	2	0.69	2
14	NO2-N (mgN/L)			0.03		0.02		0.61		0.01		0.01	
15	NO3-N (mgN/L)	D	M	2.26	M	1.99	M	1.96	M	1.13	M	0.68	M
16	P-Tot (mgP/L)	R	O	0.070	O	0.080	O	0.070	O	0.070	O	0.070	O
17	SiO2 (mg/L)	Y	N	22.2	N	21.7	N	21.0	N	17.9	N	19.2	N
18	SO4 (mg/L)		T		T	10.1	T	11.3	T	11.7	T	12.7	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			0.5		1.2		1.4		1.1		3.8	
2	COD (mg/L)			143.3		91.7		14.0		5.0		13.0	
3	DO (mg/L)			6.1		4.1		7.9		9.2		10.1	
4	DO_SAT% (%)			77		54		99		111		131	
5	FCol-MPN (MPN/100mL)			26000		220		170		270		20	
6	Tcol-MPN (MPN/100mL)			79000		520		330		1300		80	
	TRACE & TOXIC												
1	Al (mg/L)			0.03		0.03		0.04		0.03		0.04	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			56		88		118		121		108	
2	HAR_Total (mgCaCO3/L)			77		181		174		168		157	
3	Na% (%)			22		35		34		34		37	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			0.5		1.4		1.4		1.4		1.5	
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub Divi. : NWR Sub Div., Himatnagar**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																					
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.75				25.28			1.69	1.35	5.80	-	-	2.373	0.72	0.58	0.573	0.56
2	Cd	Cadmium	microgram / l							0.059				0.12			0.25	0.00	0.07	0.01	7.90	2.00	0.10	0.09	0.00	0.19
3	Cr	Chromium	microgram / l							2.10				4.82			7.74	0.00	1.53	15.09	2.98	0.00	0.24	19.50	0.00	0.99
4	Cu	Copper	microgram / l							5.50				7.22			BDL	-	2.28	4.40	9.72	-	1.32	4.15	-	4.94
5	Hg	Mercury	microgram / l							0.56				-			BDl	0.051	-	-	-	0.135	-	-	0.00	-
6	Ni	Nickel	microgram / l							-				4.27	ONCE IN 2 MONTH	POOLING CONDITION	8.73	0.00	1.10	0.11	1.67	4.36	0.32	3.13	0.00	0.13
7	Pb	Lead	microgram / l							3.18				0.760			4.680	0.00	1.814	0.45	10.37	13.00	0.45	0.08	0.00	1.31
8	Zn	Zinc	microgram / l	RIVER DRY	RIVER DRY	RIVER DRY	RIVER DRY	RIVER DRY	RIVER DRY	12.29	RIVER DRY	RIVER DRY	RIVER DRY	12.43			13.00	19.60	2.00	14.00	9.30	4.00	4.80	3.50	0.00	4.10
b	**Pesticides**		microgram / l															Pesticides value not reported.								
1	Aldrin	Aldrin	microgram / l							-				-			-		-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l							-				-			-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l							-				-			-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l							-				-			-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l							-				-			-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l							-				-			-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l							-				-			-		-	-	-	-	-	-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Sabarmati at Derol Bridge (01 02 12 006) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : N.W.R.Sub Div., Himatnagar**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	241	3189	0.000	41.06
2	EC_FLD (µmho/cm)	5	886	436	616
3	EC_GEN (µmho/cm)	5	564	179	460
4	pH_FLD (pH units)	5	7.6	7.4	7.4
5	pH_GEN (pH units)	5	8.5	8.0	8.4
6	SS (mg/L)	5	248	40	126
7	TDS (mg/L)	5	366	108	299
8	Temp (deg C)	5	29.0	25.0	27.6
9	Turb (NTU)	5	116.0	1.0	31
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	11.6	0.0	7.5
2	ALK-TOT (mgCaCO3/L)	5	140	68	122
3	Ca (mg/L)	5	49	22	39
4	Cl (mg/L)	5	74.0	14.0	55.2
5	CO3 (mg/L)	5	14.0	0.0	9
6	F (mg/L)	5	0.80	0.12	0.45
7	Fe (mg/L)	5	0.2	0.1	0.1
8	HCO3 (mg/L)	5	146	83	130
9	K (mg/L)	5	1.3	0.9	1
10	Mg (mg/L)	5	22.4	5.1	12.7
11	Na (mg/L)	5	44.5	10.2	36
12	NH3-N (mg N/L)	5	0.65	0.19	0.47
13	NO2+NO3 (mg N/L)	5	2.57	0.69	1.74
14	NO2-N (mgN/L)	5	0.61	0.01	0.14
15	NO3-N (mgN/L)	5	2.26	0.68	1.6
16	P-Tot (mgP/L)	5	0.080	0.070	0.072
17	SiO2 (mg/L)	5	22.2	17.9	20.4
18	SO4 (mg/L)	4	12.7	10.1	11.4
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	3.8	0.5	1.6
2	COD (mg/L)	5	143.3	5.0	53.4
3	DO (mg/L)	5	10.1	4.1	7.5
4	DO_SAT% (%)	5	131	54	95
5	FCol-MPN (MPN/100mL)	5	26000	20	5336
6	Tcol-MPN (MPN/100mL)	5	79000	80	16246
	TRACE & TOXIC				
1	Al (mg/L)	5	0.04	0.03	0.03
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	121	56	98
2	HAR_Total (mgCaCO3/L)	5	181	77	151
3	Na% (%)	5	37	22	33
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	1.5	0.5	1.2
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Sabarmati at Derol Bridge (01 02 12 006) | **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati | **River Water** | **Sub-Division : N.W.R.Sub Div., Himatnagar**

S.No	Parameters	Flood											Winter										Summer										
		Jun - Oct											Nov - Feb										Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																
1	Q (cumec)	34.48	88.52	47.55	0.943	0.910	0.476	21.02	2.031	3.669	0.649	24.71	0.992	3.313	0.076	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)				562			994	989	713	658	884									988	426	437									430	423	437
3	EC_GEN (µmho/cm)	340	274	482	612	496	407	315	404	387	579	372									575	590	529									564	614	501
4	pH_FLD (pH units)				7.4			8.4	7.5	7.4	7.4	7.4									7.5	7.3	7.4									7.3	7.3	7.6
5	pH_GEN (pH units)	8.0	7.5	8.2	8.1	8.5	8.3	7.8	8.4	8.1	8.3	8.2					O	O	O	O	8.6	8.4	8.5	O	O	O	O	O	O	O	O	8.4	8.4	8.5
6	SS (mg/L)	30	591	26	17	30	35	73	60	84	60	208					N	N	N	N	45	66	86	N	N	N	N	N	N	N	N	30	68	40
7	TDS (mg/L)	238	190	306	390	322	249	196	250	252	378	237	O	O	O	O	C	C	C	C	368	375	347	C	C	C	C	C	C	C	C	358	376	325
8	Temp (deg C)	25.0	22.5	24.5	28.0	26.0	27.5	30.7	30.6	28.0	29.0	28.5	N	N	N	N	E	E	E	E	26.5	27.5	26.0	E	E	E	E	E	E	E	E	29.0	28.0	29.0
9	Turb (NTU)	2.0	533.0	49.5	14.5	1.0	17.5	95.5	5.0	87.0	12.5	74.0	C	C	C	C					5.0	4.5	1.0									5.0		5.0
	CHEMICAL												E	E	E	E	I	I	I	I				I	I	I	I	I	I	I	I			
																	N	N	N	N				N	N	N	N	N	N	N	N			
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	5.8	0.8	0.0	5.8	0.0	5.0	5.8	I	I	I	I					10.0	7.1	10.0									4.2	10.0	5.8
2	ALK-TOT (mgCaCO3/L)	180	154	228	280	128	107	96	152	116	164	104	N	N	N	N	2	2	2	2	148	170	134	2	2	2	2	2	2	2	2	132	160	131
3	Ca (mg/L)	31	23	38	46	40	34	30	48	38	52	29									51	49	48									55	49	43
4	Cl (mg/L)	26.0	19.0	52.0	79.0	70.0	50.0	25.0	32.0	40.0	56.0	44.0	2	2	2	2	M	M	M	M	81.0	101.0	64.0	M	M	M	M	M	M	M	M	80.0	110.0	60.0
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	7.0	1.0	0.0	7.0	0.0	6.0	7.0					O	O	O	O	12.0	8.5	12.0	O	O	O	O	O	O	O	O	5.0	12.0	7.0
6	F (mg/L)	0.26	0.31	0.86	0.72	0.95	0.55	0.38	0.57	0.78	0.82	0.14	M	M	M	M	N	N	N	N	0.59	0.36	0.59	N	N	N	N	N	N	N	N	0.41	0.43	0.80
7	Fe (mg/L)	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	O	O	O	O	T	T	T	T	0.2	0.2	0.1	T	T	T	T	T	T	T	T	0.3	0.2	0.2
8	HCO3 (mg/L)	110	94	139	171	142	129	118	171	142	188	113	N	N	N	N	H	H	H	H	157	191	140	H	H	H	H	H	H	H	H	151	171	146
9	K (mg/L)	1.0	1.0	0.8	2.0	1.4	1.0	0.9	1.0	1.2	0.9	1.0	T	T	T	T	/	/	/	/	1.0	0.9	0.9	/	/	/	/	/	/	/	/	1.1	0.7	1.3
10	Mg (mg/L)	5.8	6.3	9.7	12.6	12.6	8.3	9.2	11.7	10.2	12.6	13.7	H	H	H	H					12.2	16.8	12.3									7.8	17.3	11.7
11	Na (mg/L)	20.0	14.0	37.0	55.6	42.8	37.8	16.2	21.6	27.9	39.3	27.3	/	/	/	/					50.2	74.2	40.9									52.8	76.8	43.5
12	NH3-N (mg N/L)			0.07	0.06	0.46	0.13	0.36	0.14	0.45	0.61	0.62					P	P	P	P	0.45	0.16	0.40	P	P	P	P	P	P	P	P	0.46	0.17	0.32
13	NO2+NO3 (mg N/L)	0.20	1.10	1.69	3.43	0.88	0.66	1.36	1.83	1.09	1.04	2.15	P	P	P	P	O	O	O	O	0.62	0.22	1.86	O	O	O	O	O	O	O	O	0.66	1.12	0.69
14	NO2-N (mgN/L)	0.04	0.07	0.03	0.04	0.03	0.03	0.03	0.01	0.03	0.01	0.02	O	O	O	O	L	L	L	L	0.01	0.00	0.31	L	L	L	L	L	L	L	L	0.02	0.02	0.01
15	NO3-N (mgN/L)	0.16	1.03	1.66	3.39	0.85	0.63	1.34	1.82	1.06	1.03	2.13	O	O	O	O	I	I	I	I	0.61	0.21	1.55	I	I	I	I	I	I	I	I	0.64	1.10	0.68
16	P-Tot (mgP/L)	0.010	0.050	0.015	0.105	0.080	0.050	0.075	0.080	0.085	0.095	0.075	L	L	L	L	N	N	N	N	0.100	0.100	0.070	N	N	N	N	N	N	N	N	0.100	0.110	0.070
17	SiO2 (mg/L)	9.8	25.0	31.6	33.8	24.1	24.4	24.2	22.9	24.9	20.9	21.9	I	I	I	I	G	G	G	G	21.1	20.1	19.5	G	G	G	G	G	G	G	G	22.2	16.8	19.2
18	SO4 (mg/L)	8.6	6.8	16.7	18.5	15.4	16.7	9.6	9.7	10.2	10.0	10.1	N	N	N	N					11.7	12.5	11.5									11.6	13.1	12.7
	BIOLOGICAL/BACTERIOLOGICAL												G	G	G	G	C	C	C	C				C	C	C	C	C	C	C	C			
1	BOD3-27 (mg/L)	0.6	1.8	0.8	0.8	2.5	2.2	2.4	0.6	0.4	1.6	0.9					O	O	O	O	1.0	0.5	1.3	O	O	O	O	O	O	O	O	1.2	1.3	3.8
2	COD (mg/L)										57.6	117.5	C	C	C	C	N	N	N	N	132.7	31.1	9.5	N	N	N	N	N	N	N	N	32.9	112.4	13.0
3	DO (mg/L)	7.4	7.7	6.6	6.3	8.5	7.0	7.5	7.8	6.8	5.6	5.1	O	O	O	O	D	D	D	D	9.2	7.5	8.5	D	D	D	D	D	D	D	D	7.0	5.2	10.1
4	DO_SAT% (%)	90	90	79	80	105	89	101	103	86	72	66	N	N	N	N	I	I	I	I	114	95	105	I	I	I	I	I	I	I	I	91	67	131
5	FCol-MPN (MPN/100mL)										840	13110	D	D	D	D	T	T	T	T	91	3100	220	T	T	T	T	T	T	T	T	2200	400	20
6	Tcol-MPN (MPN/100mL)										11450	39760	I	I	I	I	I	I	I	I	17445	28250	815	I	I	I	I	I	I	I	I	24000	24000	80
	TRACE & TOXIC												T	T	T	T	O	O	O	O				O	O	O	O	O	O	O	O			
1	Al (mg/L)	0.02	0.11	0.04	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.03	I	I	I	I	N	N	N	N	0.03	0.02	0.03	N	N	N	N	N	N	N	N	0.02	0.02	0.04
	CHEMICAL INDICES												O	O	O	O	/	/	/	/				/	/	/	/	/	/	/	/			
1	HAR_Ca (mgCaCO3/L)	76	58	94	114	100	84	76	120	94	130	72	N	N	N	N					126	123	120	R	R	R	R	R	R	R	R	136	121	108
2	HAR_Total (mgCaCO3/L)	100	84	135	167	153	119	115	169	137	183	129					R	R	R	R	177	193	171	D	D	D	D	D	D	D	D	169	193	157
3	Na% (%)	30	22	36	42	38	40	23	22	30	32	28					D	D	D	D	38	45	34									40	46	37
4	SAR (-)	0.9	0.6	1.3	1.9	1.5	1.5	0.7	0.7	1.0	1.3	1.0									1.6	2.3	1.4									1.8	2.4	1.5
	PESTICIDES																																

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Sabarmati at Voutha**	**Code**	**: 01 02 12 013**
State	: Gujarat	District	Ahmedabad
Basin	: Sabarmati	Independent River	: Sabarmati
Tributary	: Sabarmati	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Sabarmati
Division	: Mahi Division, Gandhinagar	Sub-Division	: Sabarmati , Ahmedabad
Drainage Area	: 19636 Sq. Km.	Bank	: Left
Latitude	: 22°38'59" N	Longitude	: 72°32'08" E
	Opening Date	Closing Date	
Gauge	: 05-08-1999		
Discharge	: 24-06-2000		
Sediment	:		
Water Quality	: 01-06-2000		

Water Quality Datasheet for the period : 2015-2016

Station Name : Sabarmati at Voutha (01 02 12 013) | **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati | **River Water Analysis** | **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	13.74	26.30	1717	43.10	36.20	44.28	24.85	28.42	23.22	10.60	14.32	11.78
2	Colour_Cod (-)	Brown	Brown	Light Brown	Brown	Brown	Light Green	Light Brown	Light Brown	Brown	Brown	Brown	Brown
3	EC_FLD (µmho/cm)	2650	1968	272	1891	1903	1952	2380	2270	2390	2410	2800	2100
4	EC_GEN (µmho/cm)	2707	2052	238	1958	1880	1985	2400	2486	2438	2545	2146	2456
5	Odour_Code (-)	other-dis-agreeable	other-dis-agreeable	odour free	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable	other-dis-agreeable
6	pH_FLD (pH units)						8.0	8.3	8.4	8.4	7.2	7.1	7.0
7	pH_GEN (pH units)	8.4	8.0	7.9	8.2	8.3	8.0	8.3	8.4	8.1	8.0	8.2	8.4
8	SS (mg/L)	233	228	205	236	184	148	197	78	184	68	84	104
9	TDS (mg/L)	1785	1251	144	1188	1173	1309	1632	1668	1658	1706	1416	1644
10	Temp (deg C)	30.6	28.0	27.0	28.0	27.0	21.0	22.0	19.0	21.0	24.0	24.0	28.0
11	Turb (NTU)	72.0	41.0	362.0	44.0	46.0	46.0	46.0	28.0	46.0	6.0	6.0	18.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	25.7	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	5.8
2	ALK-TOT (mgCaCO3/L)	464	308	72	240	236	236	368	424	440	436	380	412
3	Ca (mg/L)	136	115	24	75	74	96	121	141	128	140	123	129
4	Cl (mg/L)	430.0	335.0	28.0	305.0	335.0	375.0	440.0	460.0	450.0	486.0	410.0	450.0
5	CO3 (mg/L)	31.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	7.0
6	F (mg/L)	0.44	0.57	0.11	1.01	0.97	0.97	0.98	0.92	0.43	0.67	0.84	0.60
7	Fe (mg/L)	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3
8	HCO3 (mg/L)	503	376	88	293	288	288	449	503	537	532	464	488
9	K (mg/L)	11.7	24.1	1.8	21.6	18.0	23.4	21.6	23.4	23.4	19.8	25.2	18.0
10	Mg (mg/L)	52.3	36.0	7.1	30.1	42.8	20.7	27.5	23.3	28.2	25.8	21.6	21.1
11	Na (mg/L)	311.0	212.2	17.5	201.8	212.2	253.8	316.2	337.0	347.4	368.2	316.2	347.4
12	NH3-N (mg N/L)	24.80	11.65	0.70	13.95	13.55	16.00	14.45	27.45	30.55	31.00	29.60	22.75
13	NO2+NO3 (mg N/L)	2.45	3.51	1.90		1.59	1.11	1.67	1.13	2.39	1.22	2.15	2.01
14	NO2-N (mgN/L)	0.06	0.60	0.12		0.01	0.01	0.03	0.04	0.06	0.05	0.59	0.09
15	NO3-N (mgN/L)	2.39	2.91	1.78	1.55	1.58	1.10	1.64	1.09	2.33	1.17	1.56	1.92
16	P-Tot (mgP/L)	0.270	0.200	0.140	0.200	0.180	0.210	0.230	0.250	0.240	0.250	0.250	0.240
17	SiO2 (mg/L)	51.5	25.0	17.7	28.9	28.2	29.6	30.8	37.6	43.9	41.9	44.5	54.4
18	SO4 (mg/L)	92.8	71.9	4.6	63.5	62.6	72.3	73.3	75.8	75.5	76.4	76.2	67.5
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	26.6	21.3	5.5	24.4	38.1	50.8	45.8	52.7	32.6	32.1	17.8	18.2
2	COD (mg/L)	174.4	79.7	42.6	86.6	123.6	89.9	57.0	126.0	170.0	97.0	131.0	120.0
3	DO (mg/L)	0.0	0.0	8.5	1.2	3.6	0.0	0.0	0.0	0.0	0.0	0.1	0.1
4	DO_SAT% (%)	0	0	107	15	45	0	0	0	0	0	1	1
5	FCol-MPN (MPN/100mL)	400	2200	3200	840	170	830	2000	8000	22000	17000	2000	4500
6	Tcol-MPN (MPN/100mL)	74000	9400	8400	1400	420	1500	8000	17000	26000	30000	17000	13000
	TRACE & TOXIC												
1	Al (mg/L)	0.07	0.06	0.03	0.07	0.06	0.07	0.07	0.08	0.08	0.07	0.09	0.07
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	341	289	60	187	184	240	302	353	319	351	307	323
2	HAR_Total (mgCaCO3/L)	558	438	90	312	363	327	416	450	436	458	397	411
3	Na% (%)	54	50	29	57	55	61	61	61	62	62	62	64
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
5	SAR (-)	5.7	4.4	0.8	5.0	4.9	6.1	6.8	6.9	7.3	7.5	6.9	7.5
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Sabarmati at Vautha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub Divi. : Sabarmati Sub Div., Ahmedabad**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																						
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-	-	1.495	-	0.75	2.51	1.61	3.77	10.20	1.65	0.460	2.18	1.345	1.62	-	-	2.049	1.24	1.52	0.409	0.01
2	Cd	Cadmium	microgram / l	0.0	8.00	2.00	3.55	0.67	7.99	0.416	0.36	3.68	0.17	0.20	0.84	7.38	0.94	0.0	0.49	11.77	70.52	6.00	0.77	0.25	0.00	0.79
3	Cr	Chromium	microgram / l	0.0	113.0	0	9.40	52.67	53.22	4.98	31.6	25.85	14.08	12.14	20.20	26.29	15.10	2.10	5.77	19.67	2.74	0.00	1.08	49.84	0.00	19.68
4	Cu	Copper	microgram / l	-	-	-	-	-	-	26.27	98.8	-	32.50	16.71	85.22	-	7.57	-	58.34	13.54	8.25	-	32.72	11.94	-	37.19
5	Hg	Mercury	microgram / l	-	1.466	0	0	0	-	0.48	-	0.295	-	-	0.28	0.636	BDl	0.188	-	-	-	0.128	-	-	0.00	-
6	Ni	Nickel	microgram / l	0	0	23.00	15.46	20.01	49.33	-	5.08	31.6	8.50	10.82	122.21	20.17	11.44	10.10	14.50	17.57	1.99	25.15	10.56	12.76	8.70	9.03
7	Pb	Lead	microgram / l	48.00	164.0	35.78	59.00	5.52	88.84	5.08	1.73	68.9	5.20	12.48	3.48	0.00	7.11	0.00	0.08	25.88	49.18	33.00	8.08	4.91	2.00	3.87
8	Zn	Zinc	microgram / l	16.00	49.00	101.2	49.63	216.0	351.9	54.31	66.00	333.0	55.00	37.77	89.00	299.4	35.00	77.20	14.00	17.00	11.10	46.00	44.30	17.10	0.00	15.90
b	Pesticides		microgram / l																							
1	Aldrin	Aldrin	microgram / l	0	0.03	0	0.0085	0.0078	0	-	-	0.0126	-	-	-	Pesticides value not reported .	-	Pesticides value not reported .	-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l	0	0.03	0.38	0.1855	2.1837	6.021	-	-	1.4696	-	-	-		-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l	0	0.07	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	0	0.08	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l	-	0.08	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l	0	0.01	0.01	0.0006	0.0078	0.051	-	-	0.0129	-	-	-		-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l	0	0.02	0	0.0039	0.0087	0.018	-	-	0.0024	-	-	-		-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l	0	0.02	0.09	0.01	0.2136	0.438	-	-	0.8465	-	-	-		-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l	0	0.01	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l	0	0.01	-	-	-	-	-	-		-	-	-		-		-	-	-	-	-	-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Sabarmati at Voutha (01 02 12 013) **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	3137	10.11	67.86
2	EC_FLD (µmho/cm)	12	2800	272	2082
3	EC_GEN (µmho/cm)	12	2707	238	2108
4	pH_FLD (pH units)	7	8.4	7.0	7.8
5	pH_GEN (pH units)	12	8.4	7.9	8.2
6	SS (mg/L)	12	236	68	162
7	TDS (mg/L)	12	1785	144	1381
8	Temp (deg C)	12	30.6	19.0	25
9	Turb (NTU)	12	362.0	6.0	63.4
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	25.7	0.0	3.1
2	ALK-TOT (mgCaCO3/L)	12	464	72	335
3	Ca (mg/L)	12	141	24	108
4	Cl (mg/L)	12	486.0	28.0	375.3
5	CO3 (mg/L)	12	31.0	0.0	3.8
6	F (mg/L)	12	1.01	0.11	0.71
7	Fe (mg/L)	12	0.4	0.2	0.3
8	HCO3 (mg/L)	12	537	88	401
9	K (mg/L)	12	25.2	1.8	19.3
10	Mg (mg/L)	12	52.3	7.1	28
11	Na (mg/L)	12	368.2	17.5	270.1
12	NH3-N (mg N/L)	12	31.00	0.70	19.7
13	NO2+NO3 (mg N/L)	11	3.51	1.11	1.92
14	NO2-N (mgN/L)	11	0.60	0.01	0.15
15	NO3-N (mgN/L)	12	2.91	1.09	1.75
16	P-Tot (mgP/L)	12	0.270	0.140	0.222
17	SiO2 (mg/L)	12	54.4	17.7	36.2
18	SO4 (mg/L)	12	92.8	4.6	67.7
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	52.7	5.5	30.5
2	COD (mg/L)	12	174.4	42.6	108.1
3	DO (mg/L)	12	8.5	0.0	1.1
4	DO_SAT% (%)	12	107	0	14
5	FCol-MPN (MPN/100mL)	12	22000	170	5262
6	Tcol-MPN (MPN/100mL)	12	74000	420	17177
	TRACE & TOXIC				
1	Al (mg/L)	12	0.09	0.03	0.07
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	353	60	271
2	HAR_Total (mgCaCO3/L)	12	558	90	388
3	Na% (%)	12	64	29	56
4	RSC (-)	12	0.1	0.0	0
5	SAR (-)	12	7.5	0.8	5.8
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Sabarmati at Voutha (01 02 12 013) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Sabarmati | **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	694.2	406.9	270.3	31.35	43.37	68.77	215.4	55.64	196.0	113.0	367.2	39.72	19.91	87.95	22.67	17.03	18.96	50.28	14.77	55.92	33.86	30.19	13.87	44.72	34.73	30.76	16.85	14.19	11.73	15.85	29.06	14.72	12.24
2	EC_FLD (µmho/cm)	1512	1056	995	1760	1472	1670	1536	1596	1357	1873	1737	2030	1888	1618	2089	2181	2048	2102	2398	1897	2329	2248	2693	1668	1334	1641	2521	2797	2460	2459	2570	2583	2437
3	EC_GEN (µmho/cm)	1557	1088	987	1865	1556	1859	1665	1492	1355	1628	1767	1927	1844	1710	2001	2174	2330	1911	2542	1919	1993	2327	2689	1652	1424	1832	2568	3207	2200	2486	2445	2652	2382
4	pH_FLD (pH units)	7.2	6.9	6.9	7.4	7.6	7.8	7.9	7.8	7.6	7.5		7.6	7.5	7.2	7.8	7.8	8.0	8.2	8.2	7.8	7.7	8.3	7.7	7.4	7.3	7.9	7.9	8.3	7.9	8.3	8.0		7.1
5	pH_GEN (pH units)	7.7	7.4	7.8	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.2	7.7	7.7	7.7	8.0	7.9	8.1	7.7	8.0	7.9	8.0	8.2	7.9	7.7	7.7	7.8	7.8	7.7	8.1	8.2	8.2	8.3	8.2
6	SS (mg/L)	137	119	36	60	110	121	98	86	146	183	217	32	71	72	88	113	245	78	93	189	116	152	43	69	36	72	127	103	96	83	207	185	85
7	TDS (mg/L)	1074	749	657	1262	1040	1264	1079	1036	906	1100	1108	1365	1170	1096	1351	1450	1579	1303	1739	1280	1301	1567	1881	1099	957	1250	1750	2233	1479	1783	1655	1748	1589
8	Temp (deg C)	29.3	30.9	32.2	31.6	32.7	32.3	29.0	31.0	30.5	31.5	28.1	23.9	26.8	25.2	24.9	25.1	25.7	24.8	23.2	23.8	18.7	20.8	30.9	31.2	30.8	33.0	33.1	32.7	29.1	30.9	29.3	25.3	25.3
9	Turb (NTU)	6.0	205.0	64.0	46.0	32.2	45.2	55.6	43.4	33.2	34.6	113.0	8.0	16.3	16.5	16.8	23.0	23.5	16.0	21.3	33.0	30.3	41.5	13.3	13.3	12.7	19.3	50.0	42.7	29.3	42.7	42.3	25.3	10.0
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	5.1	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	1.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.9	9.4	1.9
2	ALK-TOT (mgCaCO3/L)	335	279	292	498	361	356	316	320	322	291	264	411	340	340	630	401	430	388	485	348	332	367	449	291	405	542	484	553	393	536	391	462	409
3	Ca (mg/L)	48	46	45	87	100	129	108	108	115	90	85	58	59	61	117	136	157	145	163	98	112	121	75	49	65	108	176	175	149	186	117	141	131
4	Cl (mg/L)	202.5	150.8	155.6	296.0	271.0	335.2	283.2	311.2	218.4	278.4	286.6	292.7	259.8	192.0	370.5	381.5	459.5	370.5	484.5	348.3	342.8	431.3	273.3	267.3	214.7	312.0	490.0	614.7	441.3	488.7	438.7	436.7	448.7
5	CO3 (mg/L)	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	6.2	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	1.8	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	2.3	11.3	2.3
6	F (mg/L)	0.77	0.70	0.63	0.70	0.68	0.89	0.72	0.71	0.71	0.57	0.62	0.69	0.85	0.81	0.88	0.65	0.87	0.66	0.68	0.78	0.49	0.83	0.85	0.79	0.83	0.61	0.86	0.93	0.80	0.52	0.70	0.74	0.70
7	Fe (mg/L)	0.0	0.1	0.3	0.8	1.0	1.0	0.7	0.3	0.4	0.5	0.3	0.0	0.0	0.2	0.8	1.2	0.9	0.5	0.5	0.6	0.4	0.4	0.0	0.1	0.2	1.0	1.1	1.0	0.4	0.4	0.7	0.4	0.4
8	HCO3 (mg/L)	204	170	178	304	300	434	385	390	393	349	310	251	208	207	384	488	523	474	592	425	405	444	274	177	247	330	590	675	480	654	472	540	495
9	K (mg/L)	5.5	7.1	6.3	11.4	10.7	8.9	7.9	6.1	6.2	7.8	15.4	10.0	12.0	6.9	9.5	14.2	13.3	6.3	9.5	9.7	6.3	22.9	12.0	10.9	7.2	15.7	14.8	17.2	7.7	9.3	11.7	9.0	21.0
10	Mg (mg/L)	14.9	14.8	14.8	17.1	24.3	19.4	17.3	20.2	20.6	21.8	33.6	16.7	19.1	13.8	20.9	19.9	19.4	17.5	25.8	23.8	31.3	24.9	18.1	19.4	18.5	17.2	27.5	29.2	22.4	28.5	22.7	53.9	22.8
11	Na (mg/L)	150.0	109.4	118.3	219.8	190.0	239.3	214.3	235.0	159.9	209.2	190.9	221.7	187.0	142.7	272.2	290.2	329.0	285.0	368.2	265.5	242.8	313.6	205.0	191.2	153.9	231.2	332.9	448.7	323.1	357.8	326.6	300.2	343.9
12	NH3-N (mg N/L)	4.38	12.24	10.98	20.64	15.58	19.12	11.22	21.40	16.11	17.53	12.93	26.10	19.88	20.94	23.47	24.15	18.94	13.57	30.78	22.76	20.72	22.11	24.70	19.19	16.55	20.83	26.32	16.12	34.15	29.28	36.42	35.48	27.78
13	NO2+NO3 (mg N/L)	0.65	1.68	1.68	2.48	2.95	1.48	2.69	1.94	3.32	3.31	2.36	0.12	1.79	2.44	3.40	2.68	1.37	2.49	2.12	1.90	1.81	1.57	0.23	2.35	1.69	4.34	2.95	1.74	2.38	2.49	3.93	2.43	1.79
14	NO2-N (mgN/L)	0.09	0.12	0.08	0.02	0.02	0.06	0.07	0.07	0.25	0.37	0.20	0.03	0.14	0.02	0.08	0.02	0.05	0.04	0.07	0.03	0.33	0.03	0.01	0.08	0.02	0.10	0.03	0.07	0.10	0.06	0.06	0.17	0.24
15	NO3-N (mgN/L)	0.57	1.56	1.60	2.46	2.92	1.42	2.62	1.87	3.07	2.94	2.04	0.09	1.64	2.42	3.32	2.66	1.32	2.45	2.05	1.87	1.49	1.54	0.21	2.27	1.67	4.24	2.92	1.68	2.29	2.43	3.87	2.26	1.55
16	P-Tot (mgP/L)	1.460	0.774	0.388	0.154	0.222	0.166	0.198	0.228	0.240	0.240	0.198	1.443	2.645	0.247	0.200	0.198	0.185	0.252	0.290	0.265	0.225	0.232	1.767	0.780	0.133	0.270	0.190	0.247	0.270	0.257	0.283	0.263	0.247
17	SiO2 (mg/L)	18.3	26.2	26.7	43.0	42.5	34.3	44.1	38.6	34.6	31.6	30.2	23.6	29.4	36.9	38.7	36.1	43.6	44.3	25.6	37.3	36.6	35.5	22.3	33.9	34.8	39.9	36.6	54.5	45.5	39.1	39.6	40.5	46.9
18	SO4 (mg/L)	50.8	52.4	50.0	89.5	103.2	80.7	73.1	86.0	72.3	52.5	59.0	84.0	82.0	69.7	112.0	100.3	93.0	121.7	128.8	51.5	79.5	74.2	93.6	78.7	57.2	119.3	92.7	116.3	125.6	120.8	56.3	95.8	73.4
	BIOLOGICAL/BACTERIOLOGICAL																																	
1	BOD3-27 (mg/L)	10.1	6.4	5.7	25.8	17.0	18.8	11.1	17.4	14.1	18.1	23.2	13.7	11.8	35.0	13.5	13.3	25.8	18.0	23.5	28.9	35.8	45.5	18.3	11.3	35.0	24.0	25.0	18.0	22.3	23.3	36.0	28.9	22.7
2	COD (mg/L)										120.6	101.4									139.3	298.1	110.7									1073.2	535.1	116.0
3	DO (mg/L)	5.0	5.5	5.8	6.3	6.5	6.5	6.0	0.9	2.5	0.9	2.7	7.1	5.7	6.7	5.4	6.7	6.5	7.0	0.1	1.8	0.6	0.0	6.0	6.9	6.7	6.1	5.7	6.1	0.0	0.0	0.1	0.0	0.1
4	DO_SAT% (%)	66	74	79	86	90	89	78	12	32	12	33	83	70	81	64	80	79	84	1	23	8	0	80	92	89	84	79	84	0	0	2	0	1
5	FCol-MPN (MPN/100mL)										3658	1362									122	3175	8208									5100	937	7833
6	Tcol-MPN (MPN/100mL)										35100	18724									9713	32800	13125									16101	16860	20000
	TRACE & TOXIC																																	
1	Al (mg/L)	0.06	0.05	0.06	0.04	0.04	0.05	0.05	0.04	0.04	0.06	0.06	0.05	0.04	0.06	0.04	0.07	0.05	0.05	0.06	0.06	0.05	0.07	0.03	0.05	0.07	0.03	0.07	0.06	0.05	0.05	0.08	0.06	0.08
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	120	116	113	217	249	323	269	269	288	224	212	146	148	152	292	340	393	362	408	245	281	303	187	122	162	270	440	437	373	465	291	352	327
2	HAR_Total (mgCaCO3/L)	182	177	175	288	351	404	341	354	374	315	352	216	227	210	379	423	474	435	515	345	411	407	262	203	239	341	554	558	466	584	386	576	422
3	Na% (%)	57	49	51	62	53	55	47	57	41	52	49	68	63	58	60	59	59	58	60	62	54	61	62	65	57	58	56	63	60	57	64	53	63
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.2	0.0	0.0
5	SAR (-)	4.6	3.3	3.7	5.7	4.4	5.1	4.5	5.3	3.1	4.8	4.2	6.6	5.4	4.3	6.0	6.1	6.6	5.9	7.1	6.2	5.1	6.8	5.5	5.9	4.3	5.5	6.1	8.3	6.5	6.4	7.2	5.5	7.3
	PESTICIDES																																	

4. BANAS BASIN

4.0 Banas Basin

4.1 Basin description

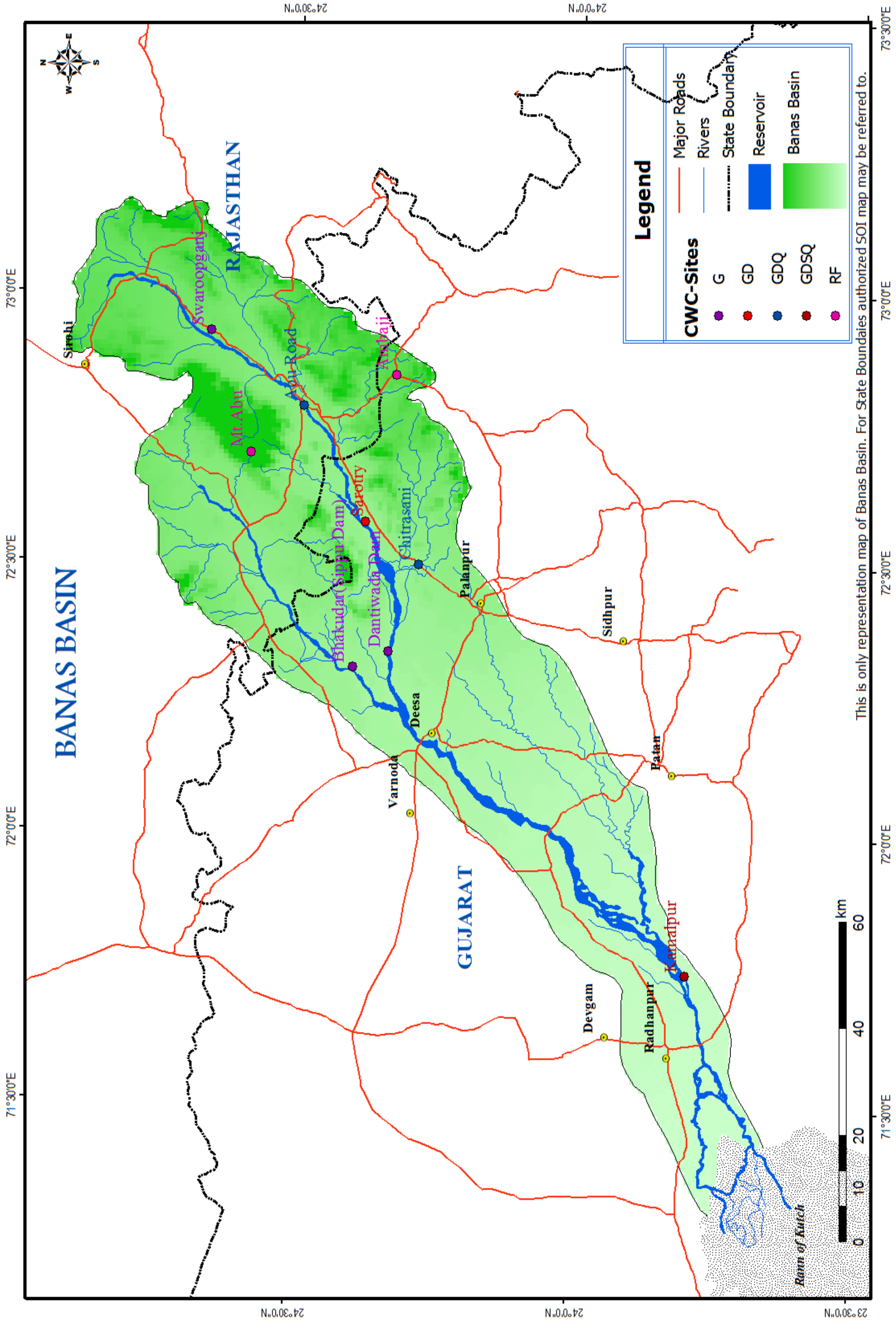
The Banas river rises near Pindwara village in Sirohi district of Rajasthan at an elevation of 372.5 m above mean sea level. Its basin map is enclosed. The total length of the river from origin to its outfall into the little Rann of Kutch. It drains an area of 8,674 sq km out of which nearly 38 % lies in Rajasthan State and the remaining 62 % falls in Gujarat state. The basin lies between the geographical co-ordinates of $71^0$15' to 73^0 15' east longitudes and 23^0 30' to 24^0 55' north latitudes. The river flows in a south – westerly direction and empties into little Rann of Kutch. It is bounded by Luni basin in the north, Sarasvati basin in the south, Aravalli Hill ranges in the east and finally, Arabian Sea in the west.

The number of principal tributaries, which contribute significantly, is seven. Sipu is the only major tributary on the right bank. The other six tributaries namely Batria, Sukli, Sewaran, Suket, Balaram and Khari drain into the main channel from left bank. Hence draining system on the left bank of the Banas river is more extensive as compared to the right bank area.

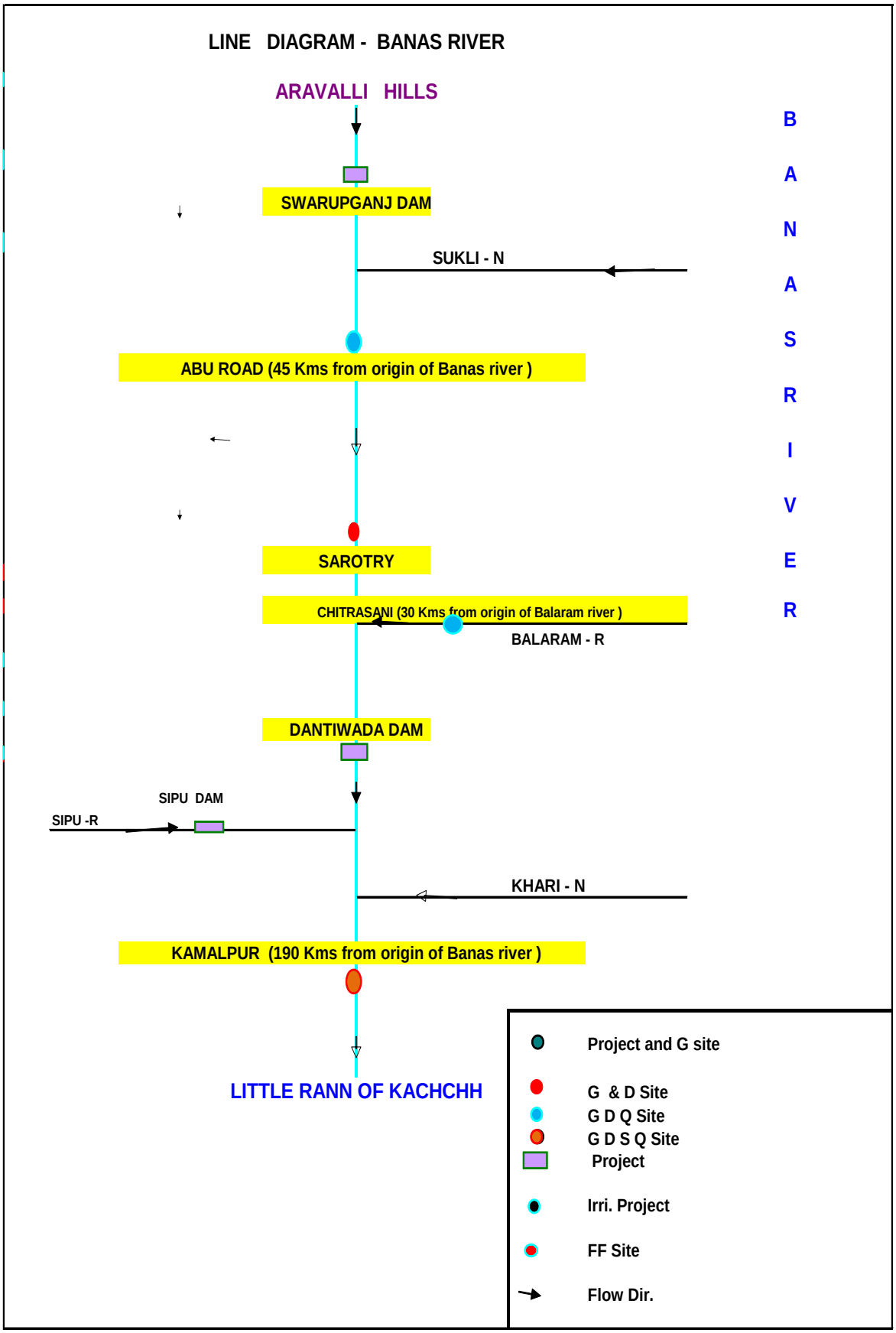
The average rainfall in the Banas basin is 921 mm. Owing to topographical characteristics, the climate is variable. The Mount Abu is one of the coldest regions and is one of the famous hill stations of India.

The Dantiwada dam and Swaroopganj dam are two main irrigation structures existing on the main channel of Banas river. The earthen dam on river Sipu, a tributary of Banas, is another project, which is under progress.

BANAS BASIN



BANAS BASIN
RAJASTHAN
GUJARAT
Legend
CWC-Sites
G
GD
GDQ
GDSQ
RF
Major Roads
Rivers
State Boundary
Reservoir
Banas Basin
Sirohi
Swaroopganj
Abu Road
Ambaji
Mt.Abu
Sarotry
Chitrasani
Palanpur
Dantiwada Dam
Bhakudar(Sipu Dam)
Sidhpur
Deesa
Varnoda
Patan
Kamalpur
Devgam
Radhanpur
Rann of Kutch
0 10 20 40 60 km
24°30'0"N
24°0'0"N
23°30'0"N
73°30'0"E
73°0'0"E
72°30'0"E
72°0'0"E
71°30'0"E
This is only representation map of Banas Basin. For State Boundaies authorized SOI map may be referred to.


LINE DIAGRAM - BANAS RIVER
ARAVALLI HILLS
B
A
N
A
S
R
I
V
E
R
SWARUPGANJ DAM
SUKLI - N
ABU ROAD (45 Kms from origin of Banas river)
SAROTRY
CHITRASANI (30 Kms from origin of Balaram river)
BALARAM - R
DANTIWADA DAM
SIPU DAM
SIPU -R
KHARI - N
KAMALPUR (190 Kms from origin of Banas river)
LITTLE RANN OF KACHCHH
Project and G site
G & D Site
G D Q Site
G D S Q Site
Project
Irri. Project
FF Site
Flow Dir.

4.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Banas at Abu Road**	**Code**	**: 01 02 02 002**
State	: Rajasthan	District	Sirohi
Basin	: WFR of Kach.-Saur. & Luni	Independent River	: Banas
Tributary	: -	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Banas
Division	: Mahi Division, Gandhinagar	Sub-Division	: B.L.Sub Divn, Palanpur
Drainage Area	: 1600 Sq. Km.	Bank	: Right
Latitude	: 24°29'38" N	Longitude	: 72°47'30" E

	Opening Date	Closing Date
Gauge	: 10-05-1978	
Discharge	: 01-06-1990	
Sediment	:	
Water Quality	: 01-07-1988	

Banas at Abu Road

Water Quality Datasheet for the period : 2015-2016

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **River Water Analysis** **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	4.208	1.516	0.000	0.000	0.000				
2	Colour_Cod (-)			Light Brown		Clear		Clear					
3	EC_FLD (µmho/cm)			420		880		451					
4	EC_GEN (µmho/cm)			311		771		1390					
5	Odour_Code (-)			odour free		odour free		odour free					
6	pH_FLD (pH units)			7.9		8.7		8.1					
7	pH_GEN (pH units)			8.1		8.5		8.2					
8	SS (mg/L)			124		68		58					
9	TDS (mg/L)			196		498		918					
10	Temp (deg C)			28.0		27.0		14.0					
11	Turb (NTU)			44.0		9.0		1.0					
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		8.3		0.0					
2	ALK-TOT (mgCaCO3/L)			88		205		292					
3	Ca (mg/L)			34		48		109					
4	Cl (mg/L)			28.0		86.0		176.0					
5	CO3 (mg/L)			0.0		10.0		0.0					
6	F (mg/L)		O		O	0.52	O	0.56	O		O		O
7	Fe (mg/L)		N	0.1	N	0.1	N	0.2	N		N		N
8	HCO3 (mg/L)	R	C	107	C	229	C	356	C	R	C	R	C
9	K (mg/L)	I	E	0.8	E	1.4	E	1.8	E	I	E	I	E
10	Mg (mg/L)	V		6.1		28.2		18.2		V		V	
11	Na (mg/L)	E	I	21.6	I	57.0	I	118.6	I	E	I	E	I
12	NH3-N (mg N/L)	R	N	0.08	N	0.13	N	0.22	N	R	N	R	N
13	NO2+NO3 (mg N/L)			2.08		2.56		2.61					
14	NO2-N (mgN/L)		2	0.04	2	0.05	2	0.05	2		2		2
15	NO3-N (mgN/L)	D	M	2.04	M	2.51	M	2.56	M	D	M	D	M
16	P-Tot (mgP/L)	R	O	0.090	O	0.110	O	0.140	O	R	O	R	O
17	SiO2 (mg/L)	Y	N	28.3	N	30.2	N	32.6	N	Y	N	Y	N
18	SO4 (mg/L)		T	17.3	T	18.2	T	21.6	T		T		T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			4.8		4.3		3.4					
2	COD (mg/L)			46.5		127.6		20.0					
3	DO (mg/L)			10.6		9.8		8.9					
4	DO_SAT% (%)			136		123		86					
5	FCol-MPN (MPN/100mL)					110		20					
6	Tcol-MPN (MPN/100mL)					920		170					
	TRACE & TOXIC												
1	Al (mg/L)			0.04		0.04		0.05					
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			84		120		274					
2	HAR_Total (mgCaCO3/L)			110		238		349					
3	Na% (%)			30		34		42					
4	RSC (-)			0.0		0.0		0.0					
5	SAR (-)			0.9		1.6		2.8					
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub Divi. : BL Sub Div., Palanpur**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																						
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.58				9.68			1.23	1.396		-				1.63		
2	Cd	Cadmium	microgram / l							0.029				0.12			0.13	0.00		0.205				0.00		
3	Cr	Chromium	microgram / l							2.64				4.07			10.22	0.00		14.46				3.68		
4	Cu	Copper	microgram / l							4.76				9.86			10.41	-		22.69				0.74		
5	Hg	Mercury	microgram / l							0.56				-			0.23	0.154		-				-		
6	Ni	Nickel	microgram / l							-				11.28	ONCE IN 2 MONTH	POLLING CONDITION	9.49	0.00		0.20				0.46		
7	Pb	Lead	microgram / l							1.440				1.030			4.92	96.30		1.59				0.68		
8	Zn	Zinc	microgram / l	RIVER	RIVER	RIVER	RIVER	RIVER	RIVER	14.35	RIVER	RIVER	RIVER	14.16			7.00	19.80	RIVER	16.00	RIVER	RIVER	RIVER	5.00	RIVER	RIVER
b	Pesticides		microgram / l								VERE	VERE	VERE						VERE		VERE	VERE	VERE		VERE	VERE
1	Aldrin	Aldrin	microgram / l							-	RER	RER	RER	-			-	Pesticides value not reported .	RER	-	RER	RER	RER	-	RER	RER
2	Alpha- BHC	Alpha- BHC	microgram / l							-	DRER	DRER	DRER	-			-		DRER	-	DRER	DRER	DRER	-	DRER	DRER
3	Beta-BHC	Beta-BHC	microgram / l							-	RY	RY	RY	-			-		RY	-	RY	RY	RY	-	RY	RY
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l							-				-			-			-				-		
5	D- BHC	D- BHC	microgram / l							-				-			-			-				-		
6	DDT	DDT	microgram / l							-				-			-			-				-		
7	Dieldrin	Dieldrin	microgram / l							-				-			-			-				-		
8	Endos-I	Endosulphan I	microgram / l							-				-			-			-				-		
9	Endos-II	Endosulphan II	microgram / l							-				-			-			-				-		
10	Endos-s	Endosulphan s	microgram / l							-				-			-			-				-		

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Banas at Abu Road (01 02 02 002) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	217	38.50	0.000	2.279
2	EC_FLD (µmho/cm)	3	880	420	584
3	EC_GEN (µmho/cm)	3	1390	311	824
4	pH_FLD (pH units)	3	8.7	7.9	8.2
5	pH_GEN (pH units)	3	8.5	8.1	8.3
6	SS (mg/L)	3	124	58	83
7	TDS (mg/L)	3	918	196	537
8	Temp (deg C)	3	28.0	14.0	23
9	Turb (NTU)	3	44.0	1.0	18
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	3	8.3	0.0	2.8
2	ALK-TOT (mgCaCO3/L)	3	292	88	195
3	Ca (mg/L)	3	109	34	64
4	Cl (mg/L)	3	176.0	28.0	96.7
5	CO3 (mg/L)	3	10.0	0.0	3.3
6	F (mg/L)	2	0.56	0.52	0.54
7	Fe (mg/L)	3	0.2	0.1	0.1
8	HCO3 (mg/L)	3	356	107	231
9	K (mg/L)	3	1.8	0.8	1.3
10	Mg (mg/L)	3	28.2	6.1	17.5
11	Na (mg/L)	3	118.6	21.6	65.7
12	NH3-N (mg N/L)	3	0.22	0.08	0.14
13	NO2+NO3 (mg N/L)	3	2.61	2.08	2.42
14	NO2-N (mgN/L)	3	0.05	0.04	0.05
15	NO3-N (mgN/L)	3	2.56	2.04	2.37
16	P-Tot (mgP/L)	3	0.140	0.090	0.113
17	SiO2 (mg/L)	3	32.6	28.3	30.4
18	SO4 (mg/L)	3	21.6	17.3	19
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	3	4.8	3.4	4.2
2	COD (mg/L)	3	127.6	20.0	64.7
3	DO (mg/L)	3	10.6	8.9	9.8
4	DO_SAT% (%)	3	136	86	115
5	FCol-MPN (MPN/100mL)	2	110	20	65
6	Tcol-MPN (MPN/100mL)	2	920	170	545
	TRACE & TOXIC				
1	Al (mg/L)	3	0.05	0.04	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	3	274	84	159
2	HAR_Total (mgCaCO3/L)	3	349	110	232
3	Na% (%)	3	42	30	36
4	RSC (-)	3	0.0	0.0	0
5	SAR (-)	3	2.8	0.9	1.8
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Banas at Abu Road (01 02 02 002) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Banas | **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	Flood											Winter										Summer										
		Jun - Oct											Nov - Feb										Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	19.96	69.05	3.965	1.237	0.000	1.914	7.048	2.933	5.656	0.209	1.145	0.000	0.552	0.158	0.000	0.000	0.000	0.795	0.426	0.351	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)									550	785	650									1035	1380	451									1580		
3	EC_GEN (µmho/cm)	219	462	734	721	453	425	513	733	433	523	541		1049					896		941	1259	1390									1729		
4	pH_FLD (pH units)									8.3	7.4	8.3									8.4	7.6	8.1									7.4		
5	pH_GEN (pH units)	7.9	7.4	8.2	8.1	8.1	8.1	8.1	8.3	8.1	8.3	8.3		7.9					7.8		8.4	8.3	8.2									8.2		
6	SS (mg/L)	46	134	63	19	36	38	42	44	16	32	96		58					44		45	36	58									48		
7	TDS (mg/L)	152	323	488	463	286	260	329	470	285	340	347		645					580		605	860	918									1142		
8	Temp (deg C)	25.7	28.0	26.0	25.5	24.0	29.0	29.0	26.4	25.7	28.0	27.5							17.0		16.5	20.0	14.0									20.0		
9	Turb (NTU)	6.7	150.0	3.5	44.0	16.0	4.0	15.5	10.0	4.5	10.0	26.5		6.5					17.0		4.5	4.0	1.0									5.0		
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	4.2		0.0					0.0		7.9	11.6	0.0									0.0		
2	ALK-TOT (mgCaCO3/L)	173	182	296	288	136	120	144	196	108	120	146		270					196		254	223	292									308		
3	Ca (mg/L)	30	27	55	49	46	42	51	71	30	42	41		36					77		67	68	109									112		
4	Cl (mg/L)	20.7	45.0	82.0	81.0	62.0	50.0	52.0	84.0	76.0	79.0	57.0		89.0					112.0		175.0	322.0	176.0									345.0		
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0		0.0					0.0		9.5	14.0	0.0									0.0		
6	F (mg/L)	0.24	0.73	0.86	0.99	0.95	0.54	0.77	0.88	0.91	0.80	0.52		0.85					1.02		0.72	0.81	0.56									1.11		
7	Fe (mg/L)	0.0	0.0	0.2	0.7	0.4	0.1	0.1	0.2	0.1	0.1	0.1		0.0					0.2		0.2	0.3	0.2									0.3		
8	HCO3 (mg/L)	106	111	181	176	166	146	176	239	132	137	168		165					239		291	244	356									376		
9	K (mg/L)	1.0	1.2	1.0	2.8	2.3	2.6	1.7	1.6	1.6	0.8	1.1		1.7					2.7		1.9	0.8	1.8									1.6		
10	Mg (mg/L)	5.1	6.6	18.0	14.6	10.7	6.8	9.7	12.6	12.2	9.7	17.1		10.2					15.6		21.4	34.5	18.2									17.5		
11	Na (mg/L)	14.7	34.0	49.0	57.4	47.1	35.1	35.8	56.0	58.0	55.9	39.3		69.0					86.1		131.3	243.4	118.6									227.8		
12	NH3-N (mg N/L)		0.05		0.53	0.29	0.22	0.43	0.07	0.27	0.47	0.10							0.25		0.46	0.34	0.22									0.75		
13	NO2+NO3 (mg N/L)	0.14	1.20	1.67	2.95	2.16	0.53	3.28	4.74	1.14	2.57	2.32		0.47					4.54		2.14	4.19	2.61									1.34		
14	NO2-N (mgN/L)	0.05	0.05	0.03	0.05	0.09	0.02	0.03	0.01	0.04	0.13	0.04		0.06					0.02		0.08	0.16	0.05									0.11		
15	NO3-N (mgN/L)	0.10	1.16	1.65	2.91	2.07	0.51	3.25	4.73	1.10	2.43	2.28		0.41					4.52		2.06	4.03	2.56									1.23		
16	P-Tot (mgP/L)	0.010	0.040	0.025	0.045	0.030	0.040	0.100	0.110	0.105	0.100	0.100		0.045					0.120		0.095	0.130	0.140									0.120		
17	SiO2 (mg/L)	11.0	21.6	32.4	23.4	20.5	29.0	37.4	38.9	19.4	26.9	29.2		25.9					26.7		22.3	22.5	32.6									20.6		
18	SO4 (mg/L)	9.1	8.4	31.5	33.5	31.0	14.4	12.2	13.3	12.2	12.5	17.8		17.7					44.8		13.3	74.0	21.6									15.1		
	BIOLOGICAL/BACTERIOLOGICAL																																	
1	BOD3-27 (mg/L)	0.5	1.0	1.1	1.0	1.9	2.1	0.5	1.4	1.4	2.1	4.5		0.7					0.7		1.9	4.2	3.4									1.0		
2	COD (mg/L)										53.6	87.0									135.7	61.4	20.0									52.6		
3	DO (mg/L)	5.4	5.4	6.9	6.8	4.5	8.3	6.8	8.4	8.2	5.6	10.2		9.3					8.2		8.7	9.3	8.9									6.3		
4	DO_SAT% (%)	66	70	85	82	53	108	88	104	100	71	129							85		89	102	86									69		
5	FCol-MPN (MPN/100mL)										2500	110									56	5800	20									79		
6	Tcol-MPN (MPN/100mL)										18100	920									17259	49000	170									14100		
	TRACE & TOXIC																																	
1	Al (mg/L)	0.02	0.06	0.06	0.02	0.03	0.05	0.04	0.05	0.04	0.04	0.04		0.03					0.06		0.04	0.06	0.05									0.05		
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	76	67	136	122	116	104	126	176	74	106	102		89					192		168	170	274									281		
2	HAR_Total (mgCaCO3/L)	98	94	211	183	161	133	167	229	125	147	174		132					257		257	314	349									353		
3	Na% (%)	24	34	34	40	39	36	32	35	50	45	32		53					42		52	63	42									58		
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.1					0.0		0.2	0.0	0.0									0.0		
5	SAR (-)	0.6	1.4	1.5	1.8	1.6	1.3	1.2	1.6	2.3	2.0	1.3		2.6					2.3		3.5	6.0	2.8									5.3		
	PESTICIDES																																	

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Balaram at Chitrasani**	**Code**	**: 01 02 02 004**
State	: Gujarat	District	Banaskantha
Basin	: WFR of Kach.-Saur. & Luni	Independent River	: Banas
Tributary	: Balaram	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Balaram
Division	: Mahi Division, Gandhinagar	Sub-Division	: B.L.Sub Divn, Palanpur
Drainage Area	: 345 Sq. Km.	Bank	: Left
Latitude	: 24°17'20" N	Longitude	: 72°29'54" E
	Opening Date	Closing Date	
Gauge	: 08-05-1978		
Discharge	: 01-06-1990		
Sediment	:		
Water Quality	: 15-07-1988		

Water Quality Datasheet for the period : 2015-2016

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **River Water Analysis** **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	19.06	2.120	1.311	0.000	0.000	0.000	0.000	0.000	0.000	
2	Colour_Cod (-)			Dark Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			440		700		720		820		800	
4	EC_GEN (µmho/cm)			311		592		680		732		733	
5	Odour_Code (-)			odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			9.0		8.7		9.0		8.9		8.3	
7	pH_GEN (pH units)			8.0		8.5		8.4		8.2		8.5	
8	SS (mg/L)			86		48		45		48		40	
9	TDS (mg/L)			194		386		442		476		483	
10	Temp (deg C)			25.0		19.0		14.0		17.0		22.0	
11	Turb (NTU)			40.0		12.0		2.0		2.0		10.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		14.1		10.0		0.0		10.0	
2	ALK-TOT (mgCaCO3/L)			100		173		196		204		220	
3	Ca (mg/L)			30		71		79		76		76	
4	Cl (mg/L)		O	30.0	O	56.0	O	76.0	O	80.0	O	84.0	O
5	CO3 (mg/L)		N	0.0	N	17.0	N	12.0	N	0.0	N	12.0	N
6	F (mg/L)		C		C	0.44	C	0.45	C	0.78	C	0.94	C
7	Fe (mg/L)	R	E	0.1	E	0.1	E	0.1	E	0.2	E	0.2	E
8	HCO3 (mg/L)	I		122		176		215		249		244	
9	K (mg/L)	V		1.0		1.1		1.3		1.4		1.4	
10	Mg (mg/L)	E	I	11.9	I	10.7	I	10.7	I	12.4	I	14.1	I
11	Na (mg/L)	R	N	22.7	N	38.3	N	50.8	N	57.0	N	61.2	N
12	NH3-N (mg N/L)			0.31		0.35		0.36		0.41		0.35	
13	NO2+NO3 (mg N/L)		2	3.21	2	3.69	2	2.73	2	1.80	2	1.48	2
14	NO2-N (mgN/L)			0.03		0.03		0.03		0.01		0.01	
15	NO3-N (mgN/L)	D	M	3.18	M	3.66	M	2.70	M	1.79	M	1.47	M
16	P-Tot (mgP/L)	R	O	0.050	O	0.060	O	0.070	O	0.080	O	0.090	O
17	SiO2 (mg/L)	Y	N	35.0	N	33.6	N	34.7	N	20.4	N	35.7	N
18	SO4 (mg/L)		T	15.4	T	16.8	T	18.8	T	19.4	T	20.6	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			1.2		1.4		1.0		1.5		1.9	
2	COD (mg/L)			13.0		55.8		2.0		9.0		3.0	
3	DO (mg/L)			6.9		6.4		7.9		8.6		6.4	
4	DO_SAT% (%)			84		69		76		88		73	
5	FCol-MPN (MPN/100mL)			390		170		2		2		20	
6	Tcol-MPN (MPN/100mL)			630		350		60		110		130	
	TRACE & TOXIC												
1	Al (mg/L)			0.05		0.05		0.06		0.06		0.07	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			76		176		196		190		190	
2	HAR_Total (mgCaCO3/L)			126		221		241		242		249	
3	Na% (%)			28		27		31		34		35	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			0.9		1.1		1.4		1.6		1.7	
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub Divi. : BL Sub Div., Palanpur**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																					
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD,Hyderabad	Analysis done by WQL-III Lab, UGD,Hyderabad	Analysis done by WQL-III Lab, UGD,Hyderabad	Analysis done by WQL-III Lab, UGD,Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.52				9.30			2.13			-	-			0.18	0.799	0.51
2	Cd	Cadmium	microgram / l							0.043				0.13			0.144			0.041	0.06			0.01	0.00	0.88
3	Cr	Chromium	microgram / l							7.17				4.22			6.41			9.56	0.54			3.25	0.00	6.22
4	Cu	Copper	microgram / l							7.81				10.37			20.03			9.23	4.06			0.79	-	3.72
5	Hg	Mercury	microgram / l							0.46				-			0.19			-	-			-	0.00	-
6	Ni	Nickel	microgram / l							-				3.67			11.32			0.97	0.26			0.72	1.80	1.88
7	Pb	Lead	microgram / l							1.890				5.110			3.54			0.50	15.46			0.39	0.00	3.42
8	Zn	Zinc	microgram / l							8.10				BDL			3.00			6.00	9.40			4.90	0.54	3.50
b	**Pesticides**		microgram / l																							
1	Aldrin	Aldrin	microgram / l							-				-			-			-	-			-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l							-				-			-			-	-			-	-	-
3	Beta-BHC	Beta-BHC	microgram / l							-				-			-			-	-			-	-	-
4	Gama- BHC	gamma-BHC (Benzene	microgram / l							-				-			-			-	-			-	-	-
5	D- BHC	D- BHC	microgram / l							-				-			-			-	-			-	-	-
6	DDT	DDT	microgram / l							-				-			-			-	-			-	-	-
7	Dieldrin	Dieldrin	microgram / l							-				-			-			-	-			-	-	-
8	Endos-I	Endosulphan I	microgram / l							-				-			-			-	-			-	-	-
9	Endos-II	Endosulphan II	microgram / l							-				-			-			-	-			-	-	-
10	Endos-s	Endosulphan s	microgram / l							-				-			-			-	-			-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Balaram at Chitrasani (01 02 02 004) **Division : Mahi Division, Gandhinagar**

Local River : Balaram **Sub-Division : B.L.Sub Divn, Palanpur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	322	625.5	0.000	4.331
2	EC_FLD (µmho/cm)	5	820	440	696
3	EC_GEN (µmho/cm)	5	733	311	610
4	pH_FLD (pH units)	5	9.0	8.3	8.8
5	pH_GEN (pH units)	5	8.5	8.0	8.3
6	SS (mg/L)	5	86	40	53
7	TDS (mg/L)	5	483	194	396
8	Temp (deg C)	5	25.0	14.0	19.4
9	Turb (NTU)	5	40.0	2.0	13.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	14.1	0.0	6.8
2	ALK-TOT (mgCaCO3/L)	5	220	100	179
3	Ca (mg/L)	5	79	30	66
4	Cl (mg/L)	5	84.0	30.0	65.2
5	CO3 (mg/L)	5	17.0	0.0	8.2
6	F (mg/L)	4	0.94	0.44	0.65
7	Fe (mg/L)	5	0.2	0.1	0.1
8	HCO3 (mg/L)	5	249	122	201
9	K (mg/L)	5	1.4	1.0	1.2
10	Mg (mg/L)	5	14.1	10.7	12
11	Na (mg/L)	5	61.2	22.7	46
12	NH3-N (mg N/L)	5	0.41	0.31	0.36
13	NO2+NO3 (mg N/L)	5	3.69	1.48	2.58
14	NO2-N (mgN/L)	5	0.03	0.01	0.02
15	NO3-N (mgN/L)	5	3.66	1.47	2.56
16	P-Tot (mgP/L)	5	0.090	0.050	0.07
17	SiO2 (mg/L)	5	35.7	20.4	31.9
18	SO4 (mg/L)	5	20.6	15.4	18.2
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	1.9	1.0	1.4
2	COD (mg/L)	5	55.8	2.0	16.6
3	DO (mg/L)	5	8.6	6.4	7.2
4	DO_SAT% (%)	5	88	69	78
5	FCol-MPN (MPN/100mL)	5	390	2	117
6	Tcol-MPN (MPN/100mL)	5	630	60	256
	TRACE & TOXIC				
1	Al (mg/L)	5	0.07	0.05	0.06
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	196	76	166
2	HAR_Total (mgCaCO3/L)	5	249	126	216
3	Na% (%)	5	35	27	31
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	1.7	0.9	1.3
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Balaram at Chitrasani (01 02 02 004) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Balaram | **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	2.026	4.150	2.160	0.110	0.226	1.532	2.028	0.720	1.348	0.210	4.498	0.000	0.086	0.000	0.000	0.000	0.000	0.000	0.227	0.228	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)									535	580	570									695	820	770											800
3	EC_GEN (umho/cm)	241	610	522	736	567	410	466	505	540	549	452		702							825	677	706											733
4	pH_FLD (pH units)									8.5	9.0	8.8									9.7	8.9	8.9											8.3
5	pH_GEN (pH units)	7.9	7.3	8.4	7.9	8.1	8.1	8.2	8.4	8.3	8.4	8.2	O	8.3	O	O	O	O	O	O	8.6	8.3	8.3	O	O	O	O	O	O	O					8.5
6	SS (mg/L)	41	36	52	17	18	48	69	56	59	36	67	N	59	N	N	N	N	N	N	45	40	47	N	N	N	N	N	N	N					40
7	TDS (mg/L)	165	380	317	465	368	254	296	318	359	350	290	C	427	C	C	C	C	C	C	538	413	459	C	C	C	C	C	C	C					483
8	Temp (deg C)	25.3	27.0	28.5	27.2	26.8	27.1	27.5	27.0	25.5	27.3	22.0	E	18.5	E	E	E	E	E	E	17.0	22.0	15.5	E	E	E	E	E	E	E					22.0
9	Turb (NTU)	5.0	10.0	7.5	1.5	1.0	39.5	6.0	4.0	18.5	12.0	26.0		9.5							5.0	4.0	2.0											10.0
	CHEMICAL												I		I	I	I	I	I	I				I	I	I	I	I	I	I					
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	3.7	0.0	0.0	0.0	0.0	5.8	11.2	11.6	7.1	N	1.7	N	N	N	N	N	N	13.7	5.0	5.0	N	N	N	N	N	N	N					10.0
2	ALK-TOT (mgCaCO3/L)	164	233	251	304	156	114	144	167	175	177	136		241							231	208	200											220
3	Ca (mg/L)	29	31	39	52	30	34	49	55	47	55	51	2	33	2	2	2	2	2	2	63	58	77	2	2	2	2	2	2	2				76
4	Cl (mg/L)	20.0	68.0	61.0	80.0	76.0	47.0	49.0	52.0	53.0	52.0	43.0	M	69.0	M	M	M	M	M	M	134.0	82.0	78.0	M	M	M	M	M	M	M	O	O	O	84.0
5	CO3 (mg/L)	0.0	0.0	4.5	0.0	0.0	0.0	0.0	7.0	13.5	14.0	8.5	O	2.0	O	O	O	O	O	O	16.5	6.0	6.0	O	O	O	O	O	O	O	N	N	N	12.0
6	F (mg/L)	0.25	0.76	0.94	1.02	0.96	0.85	0.85	0.97	0.91	0.45	0.44	N	0.77	N	N	N	N	N	N	0.72	0.88	0.61	N	N	N	N	N	N	N	C	C	C	0.94
7	Fe (mg/L)	0.0	0.0	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.1	T	0.0	T	T	T	T	T	T	0.2	0.2	0.1	T	T	T	T	T	T	T	E	E	E	0.2
8	HCO3 (mg/L)	100	142	149	186	190	139	176	190	186	188	149	H	145	H	H	H	H	H	H	249	242	232	H	H	H	H	H	H	H					244
9	K (mg/L)	1.0	0.9	1.1	2.6	2.1	1.0	1.1	1.1	1.4	0.9	1.0	/	1.5	/	/	/	/	/	/	1.9	0.8	1.3	/	/	/	/	/	/	/	I	I	I	1.4
10	Mg (mg/L)	5.2	9.7	11.7	11.2	22.4	8.3	8.8	10.7	18.0	15.6	11.3		9.7							21.4	28.2	11.5								N	N	N	14.1
11	Na (mg/L)	14.0	52.0	42.4	59.7	55.6	35.6	35.7	37.2	39.8	37.2	30.5		53.0							103.6	56.0	53.9											61.2
12	NH3-N (mg N/L)			0.05	0.28	0.46	0.54	0.30	0.07	0.46	0.13	0.33	P	0.05	P	P	P	P	P	P	0.40	0.14	0.39	P	P	P	P	P	P	P	2	2	2	0.35
13	NO2+NO3 (mg N/L)	0.14	0.19	0.83	0.81	0.10	0.57	0.91	1.50	0.54	0.48	3.45	O	0.21	O	O	O	O	O	O	0.88	0.81	2.26	O	O	O	O	O	O	O					1.48
14	NO2-N (mgN/L)	0.03	0.01	0.02	0.01	0.03	0.04	0.01	0.01	0.01	0.03	0.03	O	0.03	O	O	O	O	O	O	0.01	0.01	0.02	O	O	O	O	O	O	O	M	M	M	0.01
15	NO3-N (mgN/L)	0.12	0.18	0.81	0.80	0.07	0.53	0.90	1.49	0.52	0.45	3.42	L	0.18	L	L	L	L	L	L	0.87	0.80	2.25	L	L	L	L	L	L	L	O	O	O	1.47
16	P-Tot (mgP/L)	0.013	0.010	0.030	0.055	0.040	0.050	0.070	0.070	0.070	0.070	0.055	I	0.020	I	I	I	I	I	I	0.075	0.060	0.075	I	I	I	I	I	I	I	N	N	N	0.090
17	SiO2 (mg/L)	12.9	20.5	37.9	29.0	21.6	28.8	35.6	38.9	34.7	31.0	34.3	N	19.4	N	N	N	N	N	N	31.4	24.2	27.5	N	N	N	N	N	N	N	T	T	T	35.7
18	SO4 (mg/L)	9.0	14.5	16.1	23.1	22.8	8.2	15.0	15.1	13.4	15.2	16.1	G	17.4	G	G	G	G	G	G	16.6	29.5	19.1	G	G	G	G	G	G	G	H	H	H	20.6
	BIOLOGICAL/BACTERIOLOGICAL																														/	/	/	
1	BOD3-27 (mg/L)	0.5	0.7	1.6	2.2	2.6	2.5	2.1	2.4	3.0	2.1	1.3	C	0.8	C	C	C	C	C	C	2.5	1.0	1.3	C	C	C	C	C	C	C	R	R	R	1.9
2	COD (mg/L)										59.8	34.4	O		O	O	O	O	O	O	126.6	18.1	5.5	O	O	O	O	O	O	O	D	D	D	3.0
3	DO (mg/L)	6.2	5.9	8.7	7.5	7.4	8.4	8.7	9.1	9.4	6.8	6.7	N	9.8	N	N	N	N	N	N	10.8	7.3	8.2	N	N	N	N	N	N	N					6.4
4	DO_SAT% (%)	76	74	112	93	91	105	110	114	115	85	77	D	9.8	D	D	D	D	D	D	10.8	7.3	8.2	D	D	D	D	D	D	D					6.4
5	FCol-MPN (MPN/100mL)										790	280	I	105	I	I	I	I	I	I	113	84	82	I	I	I	I	I	I	I					73
6	Tcol-MPN (MPN/100mL)										17100	490	T		T	T	T	T	T	T	56	2550	2	T	T	T	T	T	T	T					20
	TRACE & TOXIC												I		I	I	I	I	I	I	27140	17500	85	I	I	I	I	I	I	I					130
1	Al (mg/L)	0.02	0.01	0.05	0.01	0.02	0.06	0.06	0.06	0.06	0.05	0.05	O	0.04	O	O	O	O	O	O	0.06	0.04	0.06	O	O	O	O	O	O	O					0.07
	CHEMICAL INDICES												N		N	N	N	N	N	N				N	N	N	N	N	N	N					
1	HAR_Ca (mgCaCO3/L)	73	78	98	130	76	86	122	136	118	138	126	/	83	/	/	/	/	/	/	158	144	193	/	/	/	/	/	/	/					190
2	HAR_Total (mgCaCO3/L)	94	119	147	177	169	121	159	181	193	203	173	R	124	R	R	R	R	R	R	247	262	241	R	R	R	R	R	R	R					249
3	Na% (%)	23	49	39	42	41	37	33	31	31	28	28	D	48	D	D	D	D	D	D	47	32	33	D	D	D	D	D	D	D					35
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0							0.0	0.0	0.0											0.0
5	SAR (-)	0.6	2.1	1.5	2.0	1.9	1.4	1.2	1.2	1.2	1.1	1.0		2.1							2.9	1.5	1.5											1.7
	PESTICIDES																																	

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Banas at Kamalpur**	**Code**	**: 01 02 02 007**
State	: Gujarat	District	Banaskantha
Basin	: WFR of Kach.-Saur. & Luni	Independent River	: Banas
Tributary	: -	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Banas
Division	: Mahi Division, Gandhinagar	Sub-Division	: B.L.Sub Divn, Palanpur
Drainage Area	: 6960 Sq. Km.	Bank	: Right
Latitude	: 23°47'59" N	Longitude	: 71°45'00" E

	Opening Date	Closing Date
Gauge	: 21-07-1971	
Discharge	: 25-07-1971	
Sediment	: 25-08-1973	
Water Quality	: 01-06-1977	

Water Quality Datasheet for the period : 2015-2016

Station Name : Banas at Kamalpur (01 02 02 007) | **Division : Mahi Division, Gandhinagar**

Local River : Banas | **River Water Analysis** | **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	108.1	0.000	4.686	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)			Brown		Clear		Clear					
3	EC_FLD (µmho/cm)			260		260		310					
4	EC_GEN (µmho/cm)			330		329		260					
5	Odour_Code (-)			odour free		odour free		odour free					
6	pH_FLD (pH units)			7.6		7.7		8.6					
7	pH_GEN (pH units)			7.8		8.7		8.6					
8	SS (mg/L)			326		39		42					
9	TDS (mg/L)			206		210		156					
10	Temp (deg C)			27.4		27.8		19.0					
11	Turb (NTU)			933.0		14.0		16.0					
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		11.6		5.8					
2	ALK-TOT (mgCaCO3/L)			80		104		84					
3	Ca (mg/L)			23		29		29					
4	Cl (mg/L)		O	24.0	O	28.0	O	14.0	O		O		O
5	CO3 (mg/L)		N	0.0	N	14.0	N	7.0	N		N		N
6	F (mg/L)		C		C	0.12	C	0.62	C		C		C
7	Fe (mg/L)	R	E	0.3	E	0.3	E	0.3	E	R	E	R	E
8	HCO3 (mg/L)	I		98		98		88		I		I	
9	K (mg/L)	V	I	0.8	I	0.9	I	0.8	I	V	I	V	I
10	Mg (mg/L)	E	N	9.5	N	13.6	N	8.8	N	E	N	E	N
11	Na (mg/L)	R		18.5		19.6		9.2		R		R	
12	NH3-N (mg N/L)		2	0.57	2	0.53	2	0.46	2		2		2
13	NO2+NO3 (mg N/L)	D		1.83		1.92		1.52		D		D	
14	NO2-N (mgN/L)	R	M	0.36	M	0.33	M	0.29	M	R	M	R	M
15	NO3-N (mgN/L)	Y	O	1.47	O	1.59	O	1.23	O	Y	O	Y	O
16	P-Tot (mgP/L)		N	0.080	N	0.080	N	0.090	N		N		N
17	SiO2 (mg/L)		T	18.5	T	19.0	T	16.9	T		T		T
18	SO4 (mg/L)		H	13.3	H	14.5	H	14.5	H		H		H
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)			7.4		4.5		1.8					
2	COD (mg/L)			9.0		79.8		11.0					
3	DO (mg/L)			8.3		9.5		7.5					
4	DO_SAT% (%)			104		119		81					
5	FCol-MPN (MPN/100mL)					170		390					
6	Tcol-MPN (MPN/100mL)					790		3500					
	TRACE & TOXIC												
1	Al (mg/L)			0.06		0.07		0.05					
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			58		72		72					
2	HAR_Total (mgCaCO3/L)			98		129		109					
3	Na% (%)			29		25		15					
4	RSC (-)			0.0		0.0		0.0					
5	SAR (-)			0.8		0.8		0.4					
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub Divi. : BL Sub Div., Palanpur**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																					
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.66							3.12			-				0.82		
2	Cd	Cadmium	microgram / l							0							0.129			0.06				0.01		
3	Cr	Chromium	microgram / l							2.22							6.40			8.17				3.07		
4	Cu	Copper	microgram / l							4.74							23.76			7.11				0.97		
5	Hg	Mercury	microgram / l							0.56							0.06			-				-		
6	Ni	Nickel	microgram / l							-							11.57			0.05				0.79		
7	Pb	Lead	microgram / l							0.87							0.92			0.73				0.23		
8	Zn	Zinc	microgram / l	R I V E	R I V E	R I V E	R I V E	R I V E	R I V E	11.34	R I V E	R I V E	R I V E	R I V E	R I V E	R I V E	16.00	R I V E	R I V E	10.00	R I V E	R I V E	R I V E	2.20	R I V E	R I V E
b	**Pesticides**		microgram / l																							
1	Aldrin	Aldrin	microgram / l	R	R	R	R	R	R	-	R	R	R	R	R	R	-	R	R	-	R	R	R	-	R	R
2	Alpha- BHC	Alpha- BHC	microgram / l	D R Y	D R Y	D R Y	D R Y	D R Y	D R Y	-	D R Y	D R Y	D R Y	D R Y	D R Y	D R Y	-	D R Y	D R Y	-	D R Y	D R Y	D R Y	-	D R Y	D R Y
3	Beta-BHC	Beta-BHC	microgram / l							-							-			-				-		
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l							-							-			-				-		
5	D- BHC	D- BHC	microgram / l							-							-			-				-		
6	DDT	DDT	microgram / l							-							-			-				-		
7	Dieldrin	Dieldrin	microgram / l							-							-			-				-		
8	Endos-I	Endosulphan I	microgram / l							-							-			-				-		
9	Endos-II	Endosulphan II	microgram / l							-							-			-				-		
10	Endos-s	Endosulphan s	microgram / l							-							-			-				-		

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Banas at Kamalpur (01 02 02 007) **Division : Mahi Division, Gandhinagar**

Local River : Banas **Sub-Division : B.L.Sub Divn, Palanpur**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	184	1071	0.000	16.16
2	EC_FLD (µmho/cm)	3	310	260	277
3	EC_GEN (µmho/cm)	3	330	260	306
4	pH_FLD (pH units)	3	8.6	7.6	8
5	pH_GEN (pH units)	3	8.7	7.8	8.4
6	SS (mg/L)	3	326	39	136
7	TDS (mg/L)	3	210	156	191
8	Temp (deg C)	3	27.8	19.0	24.7
9	Turb (NTU)	3	933.0	14.0	321
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	3	11.6	0.0	5.8
2	ALK-TOT (mgCaCO3/L)	3	104	80	89
3	Ca (mg/L)	3	29	23	27
4	Cl (mg/L)	3	28.0	14.0	22
5	CO3 (mg/L)	3	14.0	0.0	7
6	F (mg/L)	2	0.62	0.12	0.37
7	Fe (mg/L)	3	0.3	0.3	0.3
8	HCO3 (mg/L)	3	98	88	95
9	K (mg/L)	3	0.9	0.8	0.8
10	Mg (mg/L)	3	13.6	8.8	10.6
11	Na (mg/L)	3	19.6	9.2	15.7
12	NH3-N (mg N/L)	3	0.57	0.46	0.52
13	NO2+NO3 (mg N/L)	3	1.92	1.52	1.76
14	NO2-N (mgN/L)	3	0.36	0.29	0.33
15	NO3-N (mgN/L)	3	1.59	1.23	1.43
16	P-Tot (mgP/L)	3	0.090	0.080	0.083
17	SiO2 (mg/L)	3	19.0	16.9	18.1
18	SO4 (mg/L)	3	14.5	13.3	14.1
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	3	7.4	1.8	4.6
2	COD (mg/L)	3	79.8	9.0	33.3
3	DO (mg/L)	3	9.5	7.5	8.4
4	DO_SAT% (%)	3	119	81	101
5	FCol-MPN (MPN/100mL)	2	390	170	280
6	Tcol-MPN (MPN/100mL)	2	3500	790	2145
	TRACE & TOXIC				
1	Al (mg/L)	3	0.07	0.05	0.06
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	3	72	58	67
2	HAR_Total (mgCaCO3/L)	3	129	98	112
3	Na% (%)	3	29	15	23
4	RSC (-)	3	0.0	0.0	0
5	SAR (-)	3	0.8	0.4	0.7
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Banas at Kamalpur (01 02 02 007) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Banas | **Sub-Division : B.L.Sub Divn, Palanpur**

S.No	Parameters	Flood											Winter										Summer										
		Jun - Oct											Nov - Feb										Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	8.748	0.022	0.000	0.000	1.763	0.713	8.345	0.000	6.719	4.394	22.55	0.000	0.000	0.000	0.000	3.146	0.000	0.000	0.000	0.000	0.997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)									295	320	260										300	310											
3	EC_GEN (µmho/cm)	160	369			253	252	233		211	244	330					220					250	260											
4	pH_FLD (pH units)									8.6	8.6	7.7										8.3	8.6											
5	pH_GEN (pH units)	8.1	6.9	O	O	7.9	8.1	8.3		8.3	8.7	8.2	O	O	O	O	8.4	O	O			8.5	8.6	O	O	O	O	O	O	O				
6	SS (mg/L)	42	32	N	N	26	26	28		21	16	183	N	N	N	N	27	N	N			12	42	N	N	N	N	N	N	N				
7	TDS (mg/L)	116	264	C	C	160	149	134		134	146	208	C	C	C	C	132	C	C			166	156	C	C	C	C	C	C	C				
8	Temp (deg C)	27.0	28.0	E	E	28.6	28.4	30.0		28.1	29.0	27.6	E	E	E	E	19.1	E	E			21.7	19.0	E	E	E	E	E	E	E				
9	Turb (NTU)	4.0	21.0			25.0	17.0	13.0		36.5	8.0	473.5					16.0					6.0	16.0											
	CHEMICAL			I	I								I	I	I	I		I	I					I	I	I	I	I	I	I				
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	N	N	0.0	2.9	0.0		2.1	10.0	5.8	N	N	N	N	2.9	N	N			4.2	5.8	N	N	N	N	N	N	N				
2	ALK-TOT (mgCaCO3/L)	161	167	2	2	76	88	92		92	84	92	2	2	2	2	82	2	2			108	84	2	2	2	2	2	2	2				
3	Ca (mg/L)	29	22			29	27	32		27	30	26					33					37	29											
4	Cl (mg/L)	18.0	24.0	M	M	30.0	21.0	12.0		5.0	20.0	26.0	M	M	M	M	20.0	M	M	O	O	22.0	14.0	M	M	M	M	M	M	M	O	O	O	O
5	CO3 (mg/L)	0.0	0.0	O	O	0.0	3.5	0.0		2.5	12.0	7.0	O	O	O	O	3.5	O	O	N	N	5.0	7.0	O	O	O	O	O	O	O	N	N	N	N
6	F (mg/L)	0.26	0.61	N	N	0.68	0.50	0.19		0.61	0.61	0.12	N	N	N	N	0.76	N	N	C	C	0.46	0.62	N	N	N	N	N	N	N	C	C	C	C
7	Fe (mg/L)	0.1	0.0	T	T	0.3	0.3	0.1		0.2	0.2	0.3	T	T	T	T	0.3	T	T	E	E	0.2	0.3	T	T	T	T	T	T	T	E	E	E	E
8	HCO3 (mg/L)	98	102	H	H	93	100	112		107	78	98	H	H	H	H	93	H	H			122	88	H	H	H	H	H	H	H				
9	K (mg/L)	1.0	0.7	/	/	0.8	0.5	0.7		0.8	0.7	0.9	/	/	/	/	0.8	/	/	I	I	0.7	0.8	/	/	/	/	/	/	/	I	I	I	I
10	Mg (mg/L)	4.8	8.3			5.8	8.8	6.8		9.7	8.8	11.5					4.9			N	N	9.7	8.8								N	N	N	N
11	Na (mg/L)	10.0	18.0			19.3	15.4	8.4		3.4	13.3	19.0					13.5					15.4	9.1											
12	NH3-N (mg N/L)			P	P	0.17	0.28	0.14		0.31	0.77	0.55	P	P	P	P	0.12	P	P	2	2		0.46	P	P	P	P	P	P	P	2	2	2	2
13	NO2+NO3 (mg N/L)	0.12	0.21	O	O	0.80	1.01	1.10		0.69	2.59	1.88	O	O	O	O	1.20	O	O	M	M	1.96	1.52	O	O	O	O	O	O	O	M	M	M	M
14	NO2-N (mgN/L)	0.02	0.01	L	L	0.03	0.01	0.03		0.01	0.02	0.35	L	L	L	L	0.01	L	L	O	O	0.01	0.29	L	L	L	L	L	L	L	O	O	O	O
15	NO3-N (mgN/L)	0.10	0.20	I	I	0.77	0.99	1.07		0.68	2.57	1.53	I	I	I	I	1.19	I	I	N	N	1.95	1.23	I	I	I	I	I	I	I	N	N	N	N
16	P-Tot (mgP/L)	0.010	0.020	N	N	0.050	0.050	0.080		0.085	0.090	0.080	N	N	N	N	0.060	N	N	T	T	0.080	0.090	N	N	N	N	N	N	N	T	T	T	T
17	SiO2 (mg/L)	9.8	18.3	G	G	26.1	25.3	34.4		24.1	23.6	18.7	G	G	G	G	24.4	G	G	H	H	21.0	16.9	G	G	G	G	G	G	G	H	H	H	H
18	SO4 (mg/L)	7.4	9.9			11.0	11.8	12.4		11.8	12.9	13.9					12.7			/	/	5.7	14.5								/	/	/	/
	BIOLOGICAL/BACTERIOLOGICAL			C	C								C	C	C	C		C	C					C	C	C	C	C	C	C				
1	BOD3-27 (mg/L)	0.5	1.4	O	O	0.7	0.8	2.2		3.1	2.3	6.0	O	O	O	O	0.3	O	O	R	R	1.7	1.8	O	O	O	O	O	O	O	R	R	R	R
2	COD (mg/L)			N	N							44.4	N	N	N	N		N	N	D	D	4.0	11.0	N	N	N	N	N	N	N	D	D	D	D
3	DO (mg/L)	5.2	5.0	D	D	6.5	6.0	9.0		9.3	7.7	8.9	D	D	D	D	8.7	D	D			7.3	7.5	D	D	D	D	D	D	D				
4	DO_SAT% (%)	65	64	I	I	83	77	119		118	100	111	I	I	I	I	94	I	I			82	81	I	I	I	I	I	I	I				
5	FCol-MPN (MPN/100mL)			T	T							170	T	T	T	T		T	T			4600	390	T	T	T	T	T	T	T				
6	Tcol-MPN (MPN/100mL)			I	I							790	I	I	I	I		I	I			48000	3500	I	I	I	I	I	I	I				
	TRACE & TOXIC			O	O								O	O	O	O		O	O					O	O	O	O	O	O	O				
1	Al (mg/L)	0.02	0.01	N	N	0.02	0.03	0.02		0.03	0.06	0.06	N	N	N	N	0.03	N	N			0.05	0.05	N	N	N	N	N	N	N				
	CHEMICAL INDICES			/	/								/	/	/	/		/	/					/	/	/	/	/	/	/				
1	HAR_Ca (mgCaCO3/L)	72	56	R	R	72	68	80		68	76	65	R	R	R	R	82	R	R			92	72	R	R	R	R	R	R	R				
2	HAR_Total (mgCaCO3/L)	92	91	D	D	96	105	108		109	113	113	D	D	D	D	102	D	D			133	109	D	D	D	D	D	D	D				
3	Na% (%)	19	30			30	24	14		6	20	27					22					20	15											
4	SAR (-)	0.5	0.8			0.9	0.7	0.3		0.1	0.5	0.8					0.6					0.6	0.4											
	PESTICIDES																																	

5. SHETRUNJI BASIN

5.0 Shetrunji Basin

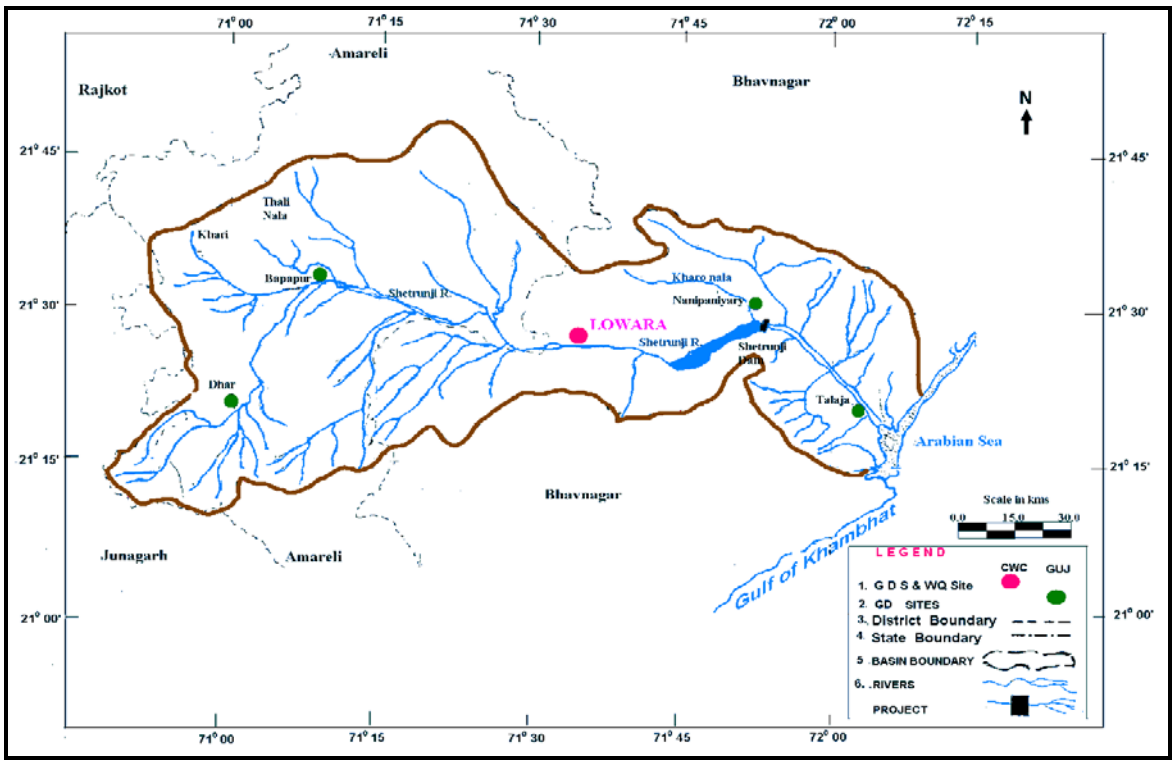
5.1 Basin description

The Shetrunji is one of the major rivers of Saurashtra. Its basin map is enclosed. It rises at Chachai hills in Gir Forest of Junagadh district of Gujarat at an elevation of 380 m above mean sea level. It flows towards east direction and empties into the gulf of Cambay. The total length of this east flowing river from its origin to the outfall is 182 km. The river drains an area of 5514 sq.km. The basin is situated approximately between east longitudes of 70^0 50' and 72^0 10' and between north latitudes of 21^0 00' and 21^0 47'.

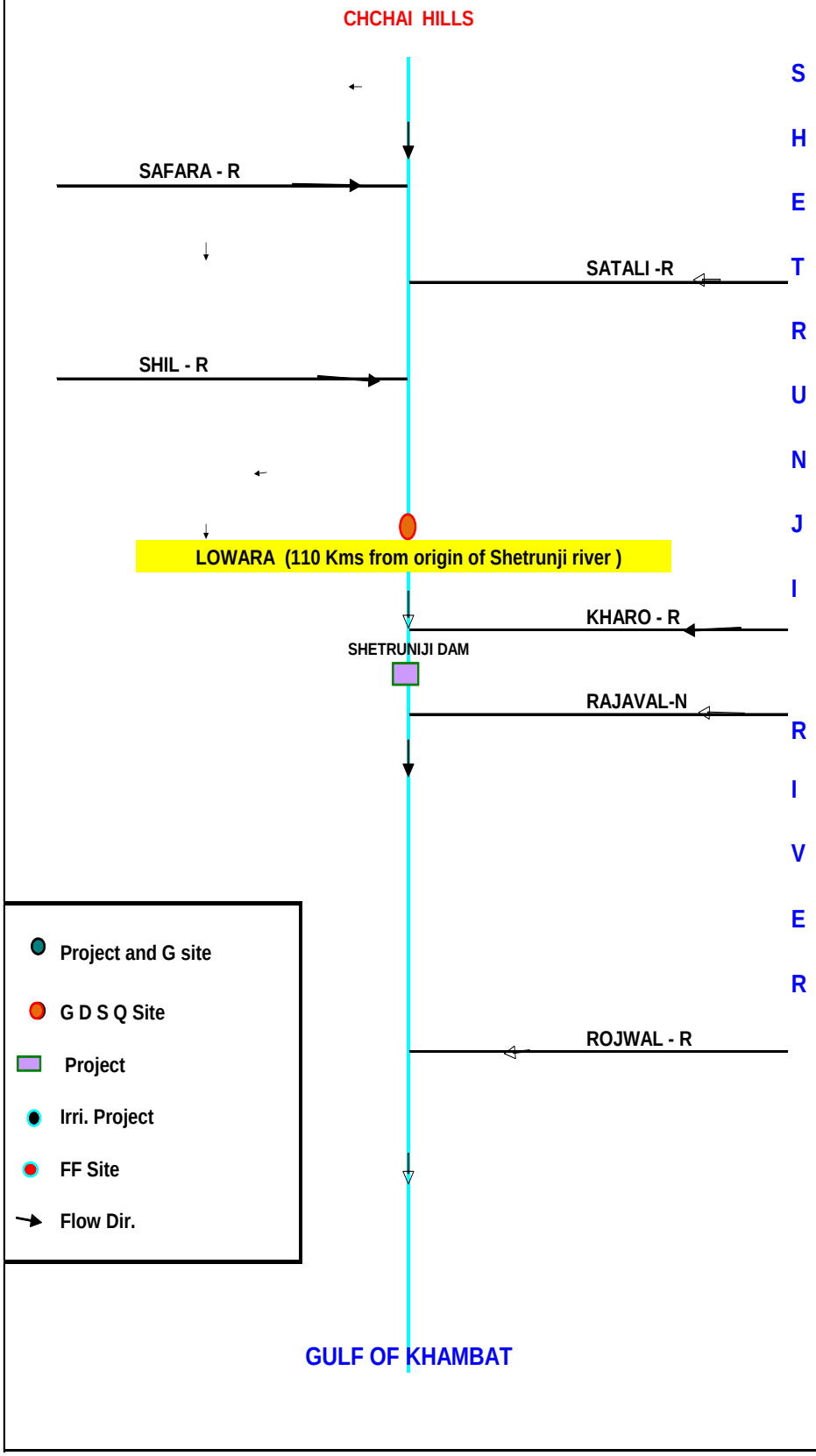
The Shetrunji receives several tributaries on both the banks. There are 9 tributaries having length more than 15 km. Out of which Safara, Shel, Kharai and Talaji are four tributaries on the right bank and remaining five tributaries viz. Stali, Thebu, Gagadia, Rajawal and Kharo are on the left bank. The drainage system on left bank of Shetrunji is more extensive as compared to the right bank area.

The average rainfall in the Shetrunji basin is 604 mm. In winter, the minimum temperature varies from 6 ^oC to 18 ^oC.

At present, there are 16 completed irrigation schemes. "Shetrunji Irrigation Scheme" is a major project and remaining 15 projects are medium irrigation schemes.



LINE DIAGRAM - SHETRUNJI BASIN



5.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2015-16**
Site	**: Shetrunji at Lowara**	**Code**	**: 01 02 09 001**
State	: Gujarat	District	Bhavnagar
Basin	: WFR of Kach.-Saur. & Luni	Independent River	: Shetrunji
Tributary	: Shetrunji	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Shetrunji
Division	: Mahi Division, Gandhinagar	Sub-Division	: Sabarmati, Ahmedabad
Drainage Area	: 3953 Sq. Km.	Bank	: Left
Latitude	: 21°26'36" N	Longitude	: 71°33'42" E
	Opening Date	Closing Date	
Gauge	: 29-11-1970		
Discharge	: 29-11-1970		
Sediment	: 25-07-1973		
Water Quality	: 01-07-1977		

Water Quality Datasheet for the period : 2015-2016

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **River Water Analysis** **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)		1.218	2.494	0.719	1.556	0.402	0.000	0.000	0.000	0.000	0.000	
2	Colour_Cod (-)			Clear		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			920		3230		5430		8540		12620	
4	EC_GEN (µmho/cm)			896		3196		5300		8433		13678	
5	Odour_Code (-)			odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			8.7		8.3		8.5		8.7		8.7	
7	pH_GEN (pH units)			8.2		8.4		8.3		8.2		8.3	
8	SS (mg/L)			80		61		76		170		158	
9	TDS (mg/L)			582		2170		3670		5904		9574	
10	Temp (deg C)			26.0		25.0		19.0		11.0		22.0	
11	Turb (NTU)			28.0		14.0		4.0		1.0		8.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		14.1		11.6		0.0		11.6	
2	ALK-TOT (mgCaCO3/L)			88		280		304		568		819	
3	Ca (mg/L)			45		93		164		246		414	
4	Cl (mg/L)		O	156.0	O	880.0	O	1350.0	O	2330.0	O	4750.0	O
5	CO3 (mg/L)		N	0.0	N	17.0	N	14.0	N	0.0	N	14.0	N
6	F (mg/L)	R	C	0.57	C	0.94	C	0.99	C	0.76	C	0.91	C
7	Fe (mg/L)	I	E	0.7	E	0.7	E	0.8	E	0.9	E	0.9	E
8	HCO3 (mg/L)	V		107		307		342		693		971	
9	K (mg/L)			2.2		3.6		7.2		10.8		19.8	
10	Mg (mg/L)	E	I	23.6	I	46.7	I	47.4	I	97.7	I	90.6	I
11	Na (mg/L)	R	N	82.0	N	590.7	N	819.5	N	1498.0	N	3162.0	N
12	NH3-N (mg N/L)			0.08		0.13		0.29		0.25		0.45	
13	NO2+NO3 (mg N/L)		2	1.79	2	2.23	2	2.26	2	2.33	2	0.85	2
14	NO2-N (mgN/L)			0.07		0.08		0.10		0.01		0.01	
15	NO3-N (mgN/L)	D	M	1.72	M	2.15	M	2.16	M	2.32	M	0.84	M
16	P-Tot (mgP/L)	R	O	0.090	O	0.100	O	0.140	O	0.150	O	0.170	O
17	SiO2 (mg/L)	Y	N	17.7	N	21.8	N	25.1	N	11.5	N	22.0	N
18	SO4 (mg/L)		N	51.1	N	56.4	N	63.3	N	92.9	N	88.7	N
	BIOLOGICAL/BACTERIOLOGICAL		T		T		T		T		T		T
1	BOD3-27 (mg/L)		H	1.8	H	1.5	H	1.8	H	3.5	H	4.4	H
2	COD (mg/L)			6.0		95.7		64.0		86.0		234.0	
3	DO (mg/L)			7.6		6.4		7.8		7.6		6.8	
4	DO_SAT% (%)			94		77		85		69		77	
5	FCol-MPN (MPN/100mL)			170		120		2		2		20	
6	Tcol-MPN (MPN/100mL)			840		540		400		130		70	
	TRACE & TOXIC												
1	Al (mg/L)			0.05		0.07		0.08		0.10		0.11	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			112		232		410		614		1035	
2	HAR_Total (mgCaCO3/L)			210		427		607		1021		1413	
3	Na% (%)			46		75		74		76		83	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			2.5		12.5		14.5		20.5		36.7	
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Shetrunji at Luwara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub Divi. : Sabarmati Sub Div., Ahmedabad**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																							
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.44				14.80			0.100	0.979	2.560	-	-	2.229	4.39	0.12	0.164	0.79
2	Cd	Cadmium	microgram / l							0.023				0.16			0.926	13.70	10.390	0.685	24.07	29.00	17.68	0.02	6.40	28.05
3	Cr	Chromium	microgram / l							5.15				7.08			8.92	0.00	7.66	23.83	5.82	0.00	0.27	7.09	0.00	21.39
4	Cu	Copper	microgram / l							6.87				17.87			4.800	-	1.640	28.28	9.70	-	41.28	1.69	-	38.57
5	Hg	Mercury	microgram / l							0.51				-			0.014	0.126	-	-	-	0.200	-	-	0.00	-
6	Ni	Nickel	microgram / l							-				20.73			13.74	56.90	2.29	0.76	8.23	128.6	-	1.30	70.50	374.6
7	Pb	Lead	microgram / l							1.360				1.620			4.980	216.5	1.441	2.63	304.6	92.00	-	17.14	46.00	68.48
8	Zn	Zinc	microgram / l	R I V E R	R I V E R	R I V E R	R I V E R	R I V E R	R I V E R	13.18	R I V E R	R I V E R	R I V E R	BDL	O N C E I N 2 M O N T H	R I V E R	14.00	23.50	10.00	26.00	10.10	9.00	11.10	3.90	6.87	4.80
b	**Pesticides**		microgram / l																							
1	Aldrin	Aldrin	microgram / l	D R Y	D R Y	D R Y	D R Y	D R Y	D R Y	-	D R Y	D R Y	D R Y	-		D R Y	-	Pesticides value not reported .	-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene	microgram / l							-				-			-		-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram / l							-				-			-		-	-	-	-	-	-	-	-
6	DDT	DDT	microgram / l							-				-			-		-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram / l							-				-			-		-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram / l							-				-			-		-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram / l							-				-			-		-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram / l							-				-			-		-	-	-	-	-	-	-	-

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Shetrunji at Lowara (01 02 09 001) **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	299	2218	0.000	17.03
2	EC_FLD (µmho/cm)	5	12620	920	6148
3	EC_GEN (µmho/cm)	5	13678	896	6301
4	pH_FLD (pH units)	5	8.7	8.3	8.6
5	pH_GEN (pH units)	5	8.4	8.2	8.3
6	SS (mg/L)	5	170	61	109
7	TDS (mg/L)	5	9574	582	4380
8	Temp (deg C)	5	26.0	11.0	20.6
9	Turb (NTU)	5	28.0	1.0	11
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	14.1	0.0	7.5
2	ALK-TOT (mgCaCO3/L)	5	819	88	412
3	Ca (mg/L)	5	414	45	192
4	Cl (mg/L)	5	4750.0	156.0	1893.2
5	CO3 (mg/L)	5	17.0	0.0	9
6	F (mg/L)	5	0.99	0.57	0.83
7	Fe (mg/L)	5	0.9	0.7	0.8
8	HCO3 (mg/L)	5	971	107	484
9	K (mg/L)	5	19.8	2.2	8.7
10	Mg (mg/L)	5	97.7	23.6	61.2
11	Na (mg/L)	5	3162.0	82.0	1230.4
12	NH3-N (mg N/L)	5	0.45	0.08	0.24
13	NO2+NO3 (mg N/L)	5	2.33	0.85	1.89
14	NO2-N (mgN/L)	5	0.10	0.01	0.05
15	NO3-N (mgN/L)	5	2.32	0.84	1.84
16	P-Tot (mgP/L)	5	0.170	0.090	0.13
17	SiO2 (mg/L)	5	25.1	11.5	19.6
18	SO4 (mg/L)	5	92.9	51.1	70.5
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	4.4	1.5	2.6
2	COD (mg/L)	5	234.0	6.0	97.1
3	DO (mg/L)	5	7.8	6.4	7.2
4	DO_SAT% (%)	5	94	69	80
5	FCol-MPN (MPN/100mL)	5	170	2	63
6	Tcol-MPN (MPN/100mL)	5	840	70	396
	TRACE & TOXIC				
1	Al (mg/L)	5	0.11	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	1035	112	481
2	HAR_Total (mgCaCO3/L)	5	1413	210	736
3	Na% (%)	5	83	46	71
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	36.7	2.5	17.3
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Shetrunji at Lowara (01 02 09 001) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Shetrunji | **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	32.08	29.29	263.6	11.55	0.493	207.7	88.54	0.092	3.029	83.12	1.497	0.175	0.000	2.110	0.760	0.000	0.678	0.199	0.000	0.649	0.000	0.100	0.000	0.000	0.000	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)									1575	4243	2075					O			O	6165	7765	6985	O	O	O	O	O	O	O		7820	8230	12620
3	EC_GEN (µmho/cm)	695	1669	564	766	5494	680	880	1406	1562	5834	2046	4951	7280	5592	4995	N	2452	4784	N	7531	8793	6867	N	N	N	N	N	N	N		9919	12104	13678
4	pH_FLD (pH units)									8.6	8.5	8.5					C			C	8.1	8.4	8.6	C	C	C	C	C	C	C		8.4	8.9	8.7
5	pH_GEN (pH units)	8.2	7.6	8.4	8.2	8.0	8.1	7.9	8.4	8.4	8.4	8.3	8.0	7.9	8.0	8.1	E	8.1	8.0	E	8.4	8.2	8.3	E	E	E	E	E	E	E		8.3	8.3	8.3
6	SS (mg/L)	74	318	188	172	732	178	254	154	182	219	71	77	273	234	424		218	200		111	160	123									138	254	158
7	TDS (mg/L)	463	1171	390	516	3759	430	597	1006	1114	4237	1376	3356	5016	4037	3612	I	1566	3820	I	5089	5966	4787	I	I	I	I	I	I	I		6548	7940	9574
8	Temp (deg C)	26.5	28.5	26.5	27.0	28.0	24.5	22.7	23.0	24.0	26.0	25.5	16.5	21.5	15.5	21.0	N	20.0	18.0	N	13.5	15.0	15.0	N	N	N	N	N	N	N		20.0	22.0	22.0
9	Turb (NTU)	3.0	264.0	385.5	94.0	3.5	566.5	476.7	12.0	27.5	391.7	21.0	6.0	6.5	7.0	10.0		11.0	10.0		11.5	7.0	2.5									4.0	6.0	8.0
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	2.1	0.0	0.0	2.1	0.0	1.7	7.9	9.4	7.1	0.0	0.0	0.0	0.0	2	0.0	0.0	2	15.8	0.0	5.8	2	2	2	2	2	2	2		0.0	0.0	11.6
2	ALK-TOT (mgCaCO3/L)	242	382	257	304	606	132	186	255	238	588	184	560	876	957	1368		400	696		673	270	436									788	552	819
3	Ca (mg/L)	35	60	51	63	147	46	59	87	59	167	69	98	139	191	257	M	149	205	M	262	116	205	M	M	M	M	M	M	M		375	162	414
4	Cl (mg/L)	65.0	216.0	63.0	91.0	1534.5	104.0	194.0	358.0	382.0	1484.7	518.0	503.0	654.0	1204.0	952.0	O	640.0	1161.0	O	2161.5	2777.0	1840.0	O	O	O	O	O	O	O		2759.0	6000.0	4750.0
5	CO3 (mg/L)	0.0	0.0	2.5	0.0	0.0	2.5	0.0	2.0	9.5	11.3	8.5	0.0	0.0	0.0	0.0	N	0.0	0.0	N	19.0	0.0	7.0	N	N	N	N	N	N	N		0.0	0.0	14.0
6	F (mg/L)	0.37	0.66	0.48	0.67	1.07	0.56	0.78	0.84	0.66	0.94	0.75	0.94	1.15	0.66	1.04	T	0.88	1.03	T	0.81	0.83	0.88	T	T	T	T	T	T	T		0.87	0.92	0.91
7	Fe (mg/L)	0.0	0.1	0.3	1.2	0.7	0.2	0.1	0.2	0.2	0.3	0.7	0.0	0.1	0.1	0.8	H	0.5	0.3	H	0.5	0.5	0.8	H	H	H	H	H	H	H		0.6	0.5	0.9
8	HCO3 (mg/L)	148	233	154	186	740	156	226	307	271	695	207	464	534	584	834	/	488	849	/	783	330	518	/	/	/	/	/	/	/		961	673	971
9	K (mg/L)	1.5	2.3	1.7	1.7	20.0	2.4	1.5	2.7	4.9	3.9	2.9	6.0	12.5	1.2	5.2		3.3	18.0		9.0	2.3	9.0									7.2	9.0	19.8
10	Mg (mg/L)	8.8	16.0	8.8	9.7	78.7	9.2	12.0	11.7	23.8	49.9	35.1	45.4	45.7	46.7	71.0		33.0	48.6		79.2	123.2	72.5									52.2	193.2	90.6
11	Na (mg/L)	49.0	167.0	47.2	63.8	1097.0	78.5	139.5	269.4	287.6	1074.0	336.4	387.0	503.0	840.3	672.0	P	432.3	871.5	P	1473.0	1743.0	1158.8	P	P	P	P	P	P	P		1847.0	3994.0	3162.0
12	NH3-N (mg N/L)		0.25	0.05	0.50	0.29	0.19	0.34	0.14	0.30	0.61	0.10	0.56	0.11	0.20	0.36	O	0.40	0.36	O	0.85	2.61	0.27	O	O	O	O	O	O	O		1.28	0.66	0.45
13	NO2+NO3 (mg N/L)	0.25	2.27	3.47	5.22	4.63	4.82	3.79	5.39	2.72	1.62	2.01	0.48	5.30	5.27	9.36	O	4.98	4.54	O	5.66	3.77	2.29	O	O	O	O	O	O	O		5.66	1.48	0.85
14	NO2-N (mgN/L)	0.05	0.06	0.06	0.03	0.06	0.02	0.03	0.01	0.07	0.09	0.07	0.06	0.49	0.11	0.32	L	0.10	0.02	L	0.13	0.09	0.06	L	L	L	L	L	L	L		0.12	0.22	0.01
15	NO3-N (mgN/L)	0.20	2.21	3.42	5.19	4.57	4.80	3.76	5.38	2.65	1.53	1.94	0.42	4.81	5.16	9.04	I	4.88	4.52	I	5.52	3.69	2.24	I	I	I	I	I	I	I		5.54	1.26	0.84
16	P-Tot (mgP/L)	0.020	0.050	0.020	0.105	0.155	0.050	0.060	0.060	0.150	0.090	0.095	0.045	0.070	0.025	0.050	N	0.130	0.150	N	0.125	0.130	0.145	N	N	N	N	N	N	N		0.150	0.120	0.170
17	SiO2 (mg/L)	15.7	34.4	29.0	29.1	24.9	30.9	26.8	18.6	21.0	24.9	19.7	19.0	35.2	31.1	35.1	G	33.7	42.6	G	22.0	19.1	18.3	G	G	G	G	G	G	G		25.0	19.2	22.0
18	SO4 (mg/L)	13.7	66.9	24.3	27.9	91.2	19.5	14.0	14.3	17.0	39.7	53.8	178.0	253.0	124.8	158.2		79.4	133.0	G	77.0	97.5	78.1									83.1	95.6	88.7
	BIOLOGICAL/BACTERIOLOGICAL																																	
1	BOD3-27 (mg/L)	0.6	1.3	2.4	2.5	2.3	1.8	0.8	2.4	2.5	3.4	1.7	0.5	0.8	1.8	0.9	C	1.2	2.0	C	3.4	6.6	2.6	C	C	C	C	C	C	C		1.9	3.9	4.3
2	COD (mg/L)										148.9	50.8					O			O	160.2	62.5	75.0	O	O	O	O	O	O	O		110.8	80.3	234.0
3	DO (mg/L)	7.1	9.1	7.3	9.4	7.9	7.8	7.1	6.3	8.6	7.1	7.0	7.5	6.9	10.0	9.2	N	6.8	7.2	N	10.4	9.8	7.7	N	N	N	N	N	N	N		8.0	4.0	6.8
4	DO_SAT% (%)	88	117	91	117	102	94	82	73	102	87	86	77	78	100	103	D	75	76	D	100	97	77	D	D	D	D	D	D	D		88	46	77
5	FCol-MPN (MPN/100mL)										1734	145					I			I	66	9400	2	I	I	I	I	I	I	I		840	200	20
6	Tcol-MPN (MPN/100mL)										11965	690					T			T	27104	46000	265	T	T	T	T	T	T	T		34500	10900	70
	TRACE & TOXIC																I			I				I	I	I	I	I	I	I				
1	Al (mg/L)	0.03	0.10	0.11	0.02	0.05	0.05	0.03	0.05	0.04	0.06	0.06	0.01	0.04	0.04	0.03	O	0.04	0.07	O	0.06	0.05	0.09	O	O	O	O	O	O	O		0.08	0.05	0.11
	CHEMICAL INDICES																N			N				N	N	N	N	N	N	N				
1	HAR_Ca (mgCaCO3/L)	87	150	126	156	367	114	148	216	148	417	172	245	348	477	641	/	373	513	/	655	290	512	/	/	/	/	/	/	/		938	406	1035
2	HAR_Total (mgCaCO3/L)	123	217	163	197	695	153	198	265	248	625	319	434	538	671	937		510	716		986	803	814									1156	1211	1413
3	Na% (%)	44	53	36	40	75	46	48	69	70	59	60	66	66	71	61		65	72		77	83	75									78	88	83
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	R	0.0	0.0	R	0.0	0.0	0.0	R	R	R	R	R	R	R		0.0	0.0	0.0
5	SAR (-)	1.9	4.3	1.5	1.9	17.8	2.6	3.7	7.2	7.8	15.3	7.5	8.1	9.4	13.5	9.6	D	8.3	14.2	D	20.5	26.9	17.5	D	D	D	D	D	D	D		23.7	50.2	36.7
	PESTICIDES																																	

6. BHADAR BASIN

6.0 Bhadar Basin

6.1 Basin description

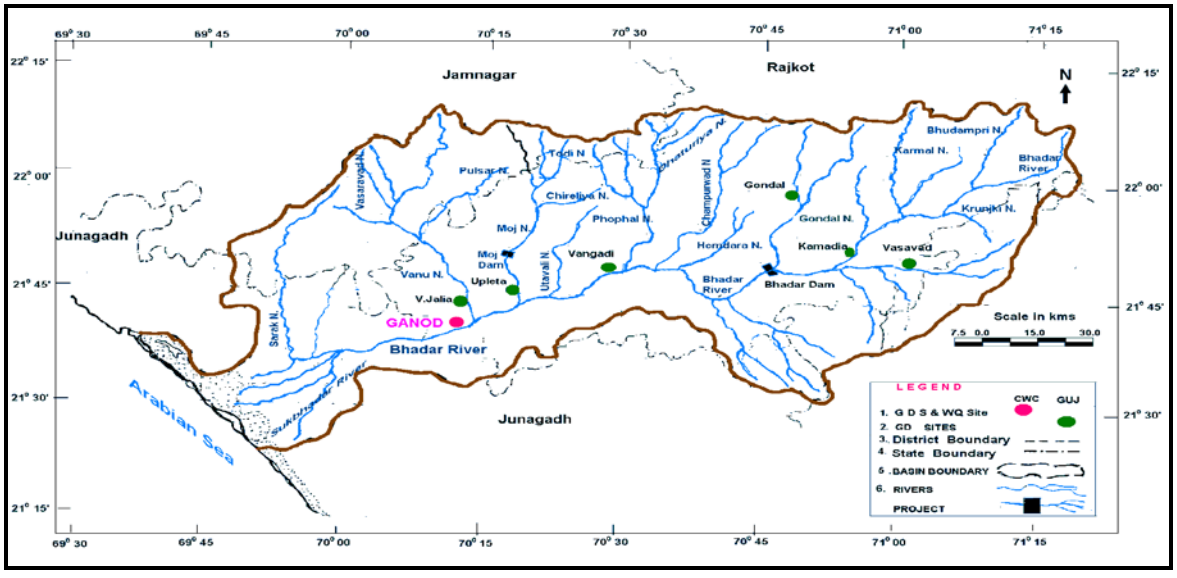
The Bhadar is one of the major rivers of Kathaiwar (Saurashtra) peninsula in Gujarat. Its basin map is enclosed. It originates near Vaddi (Aniali Village) about 26 km north – west of Jasdan in Rajkot district at an elevation of 261 m above mean sea level.

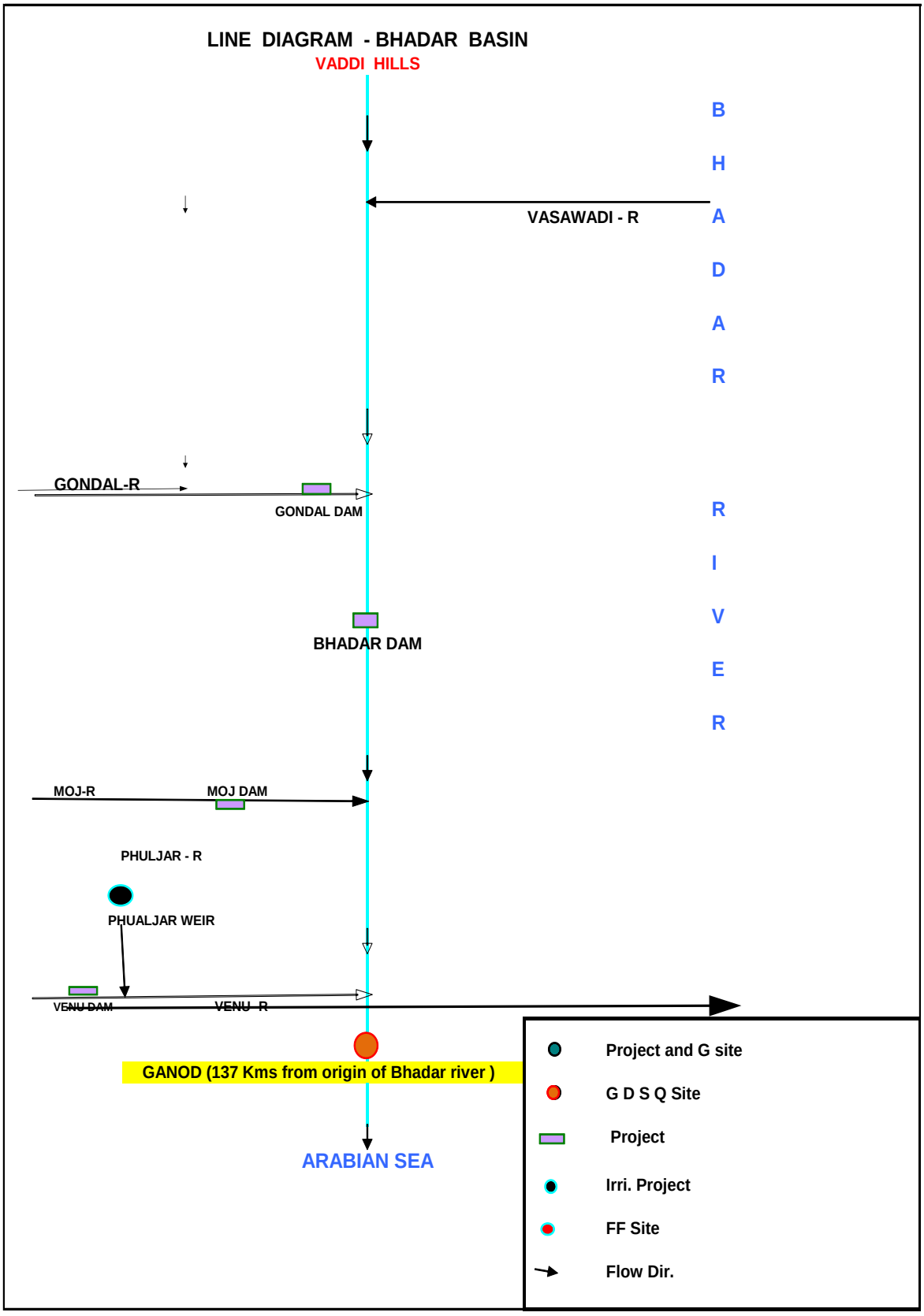
It flows towards South up to Jasdan and turns towards south - west upto Jetpur and finally changes its direction towards west till its confluence with Arabian sea at Naviobandar (Porbandar). The total length of this river is 198 km. It has a drainage area of 7094 sq.km out of which 706 sq km is in hilly and the rest in plain regions of Saurashtra. The basin lies between geographical co-ordinates of 21^0 25' and 22^0 10' north latitudes and 69^0 45' and 71^0 20' east longitudes. It drains about $1/7^{th}$ of the area of Saurashtra.

The Bhadar receives several tributaries on both the banks. There are 9 major tributaries having lengths more than 25 km out of which 6 tributaries namely Gandali, Chapparwadi, Phopal, Utawali, Moj and Venu are feeding from the right and the remaining 3 tributaries namely Vasavadi, Surwa and Galolio from the left. The drainage system of the river on right bank is more extensive as compared to the left bank.

The average rainfall in Bhadar basin is 625 mm. In winter the temperature vary between 4 ^{0}C and 15 ^{0}C in different Parts of the region. May is the hottest month. Maximum temperature varies between 40 ^{0}C and 45 ^{0}C.

At present, there are 12 completed structures, either reservoirs or weirs, in Bhadar catchment.




LINE DIAGRAM - BHADAR BASIN
VADDI HILLS
B
H
A
D
A
R
VASAWADI - R
GONDAL-R
GONDAL DAM
R
I
V
E
R
BHADAR DAM
MOJ-R
MOJ DAM
PHULJAR - R
PHUALJAR WEIR
VENU DAM
VENU R
GANOD (137 Kms from origin of Bhadar river)
ARABIAN SEA
Project and G site
G D S Q Site
Project
Irri. Project
FF Site
Flow Dir.

6.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2015 -16**
Site	**: Bhadar at Ganod**	**Code**	**: 01 02 07 001**
State	: Gujarat	District	Rajkot
Basin	: WFR of Kach.-Saur. & Luni	Independent River	: Bhadar
Tributary	: Bhadar	Sub Tributary	:
Sub-Sub Tributary	:	Local River	: Bhadar
Division	: Mahi Division, Gandhinagar	Sub-Division	: Sabarmati , Ahmedabad
Drainage Area	: 6266 Sq. Km.	Bank	: Right
Latitude	: 21°39'53" N	Longitude	: 70°10'52" E
	Opening Date	Closing Date	
Gauge	: 14-11-1970		
Discharge	: 14-11-1970		
Sediment	: 07-07-1973		
Water Quality	: 01-07-1973		

Water Quality Datasheet for the period : 2015-2016

Station Name : Bhadar at Ganod (01 02 07 001) | **Division : Mahi Division, Gandhinagar**

Local River : Bhadar | **River Water Analysis** | **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	01-06-2015	01-07-2015	01-08-2015	01-09-2015	01-10-2015	02-11-2015	01-12-2015	01-01-2016	01-02-2016	01-03-2016	01-04-2016	02-05-2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000			
2	Colour_Cod (-)	Light Green		Light Brown		Light Green		Light Green		Dark Green			
3	EC_FLD (µmho/cm)	2365		500		488		534		584			
4	EC_GEN (µmho/cm)	2200		339		498		630		1148			
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free			
6	pH_FLD (pH units)	8.3		8.2		7.5		7.2		7.1			
7	pH_GEN (pH units)	8.8		8.3		8.5		8.7		8.4			
8	SS (mg/L)	118		59		54		56		54			
9	TDS (mg/L)	1428		210		320		410		762			
10	Temp (deg C)	29.0		29.0		30.0		18.0		16.0			
11	Turb (NTU)	81.0		66.0		87.0		72.0		34.0			
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	15.8		0.0		8.3		8.3		4.2			
2	ALK-TOT (mgCaCO3/L)	255		64		129		153		228			
3	Ca (mg/L)	87		25		39		55		82			
4	Cl (mg/L)	450.0	O	46.0	O	68.0	O	90.0	O	200.0	O		O
5	CO3 (mg/L)	19.0	N	0.0	N	10.0	N	10.0	N	5.0	N		N
6	F (mg/L)	0.81	C	0.26	C	0.49	C	0.57	C	0.44	C	R	C
7	Fe (mg/L)	0.4	E	0.1	E	0.2	E	0.2	E	0.2	E	I	E
8	HCO3 (mg/L)	273		78		137		166		268		V	
9	K (mg/L)	5.4		0.8		1.1		1.3		1.6		E	
10	Mg (mg/L)	47.4	I	7.3	I	17.3	I	12.6	I	22.6	I	R	I
11	Na (mg/L)	274.6	N	30.0	N	40.4	N	59.1	N	123.8	N		N
12	NH3-N (mg N/L)	0.82		0.08		0.11		0.15		0.38			
13	NO2+NO3 (mg N/L)	1.08	2	0.28	2	0.67	2	0.45	2	1.51	2		2
14	NO2-N (mgN/L)	0.02		0.01		0.34		0.02		0.08			
15	NO3-N (mgN/L)	1.06		0.27		0.33		0.43		1.43			
16	P-Tot (mgP/L)	0.120	M	0.060	M	0.060	M	0.070	M	0.080	M	D	M
17	SiO2 (mg/L)	29.2	O	16.4	O	17.1	O	18.1	O	35.9	O	R	O
18	SO4 (mg/L)	75.4	N	19.8	N	21.2	N	22.3	N	24.6	N	Y	N
	BIOLOGICAL/BACTERIOLOGICAL		T		T		T		T		T		T
1	BOD3-27 (mg/L)	7.3	H	3.9	H	2.3	H	3.4	H	6.4	H		H
2	Chlf-a (µg/L)					120.0							
3	COD (mg/L)	110.2		15.0		67.8		21.0		29.0			
4	DO (mg/L)	7.4		8.3		4.8		6.8		11.9			
5	DO_SAT% (%)	96		107		64		71		120			
6	FCol-MPN (MPN/100mL)	340		210		540		20		790			
7	Tcol-MPN (MPN/100mL)	79000		430		17		220		1300			
	TRACE & TOXIC												
1	Al (mg/L)	0.06		0.04		0.04		0.05		0.06			
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	216		63		97		136		204			
2	HAR_Total (mgCaCO3/L)	414		94		169		189		299			
3	Na% (%)	59		41		34		40		47			
4	RSC (-)	0.0		0.0		0.0		0.0		0.0			
5	SAR (-)	5.9		1.4		1.4		1.9		3.1			
	PESTICIDES												

Pesticides , Trace and Toxic element analysis

Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub Divi. : Sabarmati Sub Div., Ahmedabad**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																					
a	Trace and Toxic			01.04.2006	02.04.2007	02.04.2008	01.04.2009	01.04.2010	01.04.2011	01.09.2011	01.02.2012	02.04.2012	28.05.2012	01.10.2012	01.03.2013	01.04.2013	01.08.2013	01.04.2014	15.05.2014	01.11.2014	02.02.2015	01.04.2015	01.05.2015	01.12.2015	01.04.2016	01.04.2016
				Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l							0.54							0.54	1.020	1.4	-	-	2.795	0.61	2.14		
2	Cd	Cadmium	microgram / l							0.233							0.22	0.00	0.16	0.18	0.08	4.00	0.71	0.02		
3	Cr	Chromium	microgram / l							6.32							6.39	0.00	2.82	13.36	1.42	0.00	3.73	5.90		
4	Cu	Copper	microgram / l							11.48							7.56	-	0.03	9.34	3.06	-	1.29	1.98		
5	Hg	Mercury	microgram / l							0.56							0.08	0.112	-	-	-	0.216	-	-		
6	Ni	Nickel	microgram / l							-							9.14	0.00	2.68	0.20	1.56	11.24	2.70	3.79		
7	Pb	Lead	microgram / l							3.22							1.68	77.00	0.046	1.17	106.8.	23.00	3.69	0.85		
8	Zn	Zinc	microgram / l	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	29.30	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	R I V E R Y	12.00	28.90	2.00	15.00	9.30	3.00	5.20	4.60	R I V E R Y	R I V E R Y
b	**Pesticides**		microgram / l																							
1	Aldrin	Aldrin	microgram / l							-							-	Pesticides value not reported .	-	-	-	-	-	-		
2	Alpha- BHC	Alpha- BHC	microgram / l							-							-		-	-	-	-	-	-		
3	Beta-BHC	Beta-BHC	microgram / l							-							-		-	-	-	-	-	-		
4	Gama- BHC	gamma-BHC (Benzene HexaChloride	microgram / l							-							-		-	-	-	-	-	-		
5	D- BHC	D- BHC	microgram / l							-							-		-	-	-	-	-	-		
6	DDT	DDT	microgram / l							-							-		-	-	-	-	-	-		
7	Dieldrin	Dieldrin	microgram / l							-							-		-	-	-	-	-	-		
8	Endos-I	Endosulphan I	microgram / l							-							-		-	-	-	-	-	-		
9	Endos-II	Endosulphan I	microgram / l							-							-		-	-	-	-	-	-		
10	Endos-s	Endosulphan s	microgram / l							-							-		-	-	-	-	-	-		

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

Water Quality Summary for the period : 2015-2016

Station Name : Bhadar at Ganod (01 02 07 001) **Division : Mahi Division, Gandhinagar**

Local River : Bhadar **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	236	2030	0.000	18.67
2	EC_FLD (µmho/cm)	5	2365	488	894
3	EC_GEN (µmho/cm)	5	2200	339	963
4	pH_FLD (pH units)	5	8.3	7.1	7.7
5	pH_GEN (pH units)	5	8.8	8.3	8.5
6	SS (mg/L)	5	118	54	68
7	TDS (mg/L)	5	1428	210	626
8	Temp (deg C)	5	30.0	16.0	24.4
9	Turb (NTU)	5	87.0	34.0	68
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	15.8	0.0	7.3
2	ALK-TOT (mgCaCO3/L)	5	255	64	166
3	Ca (mg/L)	5	87	25	57
4	Cl (mg/L)	5	450.0	46.0	170.8
5	CO3 (mg/L)	5	19.0	0.0	8.8
6	F (mg/L)	5	0.81	0.26	0.51
7	Fe (mg/L)	5	0.4	0.1	0.2
8	HCO3 (mg/L)	5	273	78	184
9	K (mg/L)	5	5.4	0.8	2
10	Mg (mg/L)	5	47.4	7.3	21.4
11	Na (mg/L)	5	274.6	30.0	105.6
12	NH3-N (mg N/L)	5	0.82	0.08	0.31
13	NO2+NO3 (mg N/L)	5	1.51	0.28	0.8
14	NO2-N (mgN/L)	5	0.34	0.01	0.09
15	NO3-N (mgN/L)	5	1.43	0.27	0.7
16	P-Tot (mgP/L)	5	0.120	0.060	0.078
17	SiO2 (mg/L)	5	35.9	16.4	23.3
18	SO4 (mg/L)	5	75.4	19.8	32.6
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	7.3	2.3	4.6
2	Chlf-a (µg/L)	1	120.0	120.0	120
3	COD (mg/L)	5	110.2	15.0	48.6
4	DO (mg/L)	5	11.9	4.8	7.8
5	DO_SAT% (%)	5	120	64	92
6	FCol-MPN (MPN/100mL)	5	790	20	380
7	Tcol-MPN (MPN/100mL)	5	79000	17	16193
	TRACE & TOXIC				
1	Al (mg/L)	5	0.06	0.04	0.05
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	216	63	143
2	HAR_Total (mgCaCO3/L)	5	414	94	233
3	Na% (%)	5	59	34	44
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	5.9	1.4	2.7
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2016

Station Name : Bhadar at Ganod (01 02 07 001) | **River Water** | **Division : Mahi Division, Gandhinagar**

Local River : Bhadar | **Sub-Division : Sabarmati Sub Divn., Ahmedabad**

S.No	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	15.77	27.08	395.3	7.406	4.716	392.9	51.19	0.000	125.2	0.000	0.000	0.031	0.000	2.907	0.588	0.000	0.000	37.77	0.000	3.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	
2	EC_FLD (µmho/cm)	474	532	218						650	500	1118									525	500	559									500	500	
3	EC_GEN (µmho/cm)	460	552	649	629	670	597	746		304	1235	1012	O	O	1624	1881					1511	1107	889	O	O							1383	1602	
4	pH_FLD (pH units)	8.8	8.3	8.3						8.5	8.2	8.0	N	N							8.2	8.2	7.1	N	N							8.3	8.1	
5	pH_GEN (pH units)	8.4	7.5	8.3	8.3	8.4	8.1	8.2		8.5	8.5	8.5	C	C	8.1	8.1					8.6	8.5	8.6	C	C							8.5	8.6	
6	SS (mg/L)	50	96	34	32	63	35	94		77	64	77	E	E	66	70					127	66	55	E	E							108	96	
7	TDS (mg/L)	301	419	421	417	438	371	493		181	813	653			1036	1282					991	705	586									892	976	
8	Temp (deg C)	27.8	28.0	28.3	27.8	28.0	27.5	26.0		28.5	30.3	29.3	I	I	21.0	23.0					17.0	25.0	17.0	I	I							28.0	29.0	
9	Turb (NTU)	1.5	174.0	9.5	129.0	20.5	196.0	31.0		21.5	20.0	78.0	N	N	15.0	10.0					13.5	21.0	53.0	N	N							27.0	9.0	
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	2.1	0.0	2.1	2.1	2.9	0.0	0.0		5.0	8.6	8.0	2	2	0.0	0.0					12.0	10.0	6.2	2	2							8.3	14.1	
2	ALK-TOT (mgCaCO3/L)	204	216	284	232	138	128	182		100	228	149			289	520					308	210	190									325	252	
3	Ca (mg/L)	33	31	55	46	62	46	75		33	74	50	M	M	74	101	P	P	P		106	67	68	M	M	P	P	P	P	P	O	96	74	O
4	Cl (mg/L)	39.0	57.0	74.0	64.0	119.0	98.0	128.0		34.0	224.7	188.0	O	O	206.0	320.0	O	O	O		321.0	253.5	145.0	O	O	O	O	O	O	O	N	350.0	350.0	N
5	CO3 (mg/L)	2.5	0.0	2.5	2.5	3.5	0.0	0.0		6.0	10.3	9.7	N	N	0.0	0.0	O	O	O		14.5	12.0	7.5	N	N	O	O	O	O	O	C	10.0	17.0	C
6	F (mg/L)	0.31	0.72	0.60	0.69	0.90	0.60	0.50		0.66	0.76	0.52	T	T	0.70	0.33	L	L	L		0.82	0.90	0.50	T	T	L	L	L	L	L	E	0.92	0.91	E
7	Fe (mg/L)	0.0	0.1	0.2	1.1	1.0	0.1	0.1		0.1	0.2	0.2	H	H	0.1	0.9	I	I	I		0.3	0.3	0.2	H	H	I	I	I	I	I		0.4	0.3	
8	HCO3 (mg/L)	122	132	171	139	161	157	222		110	257	163			176	317					347	232	217									376	273	
9	K (mg/L)	1.5	1.4	0.7	2.6	3.6	1.9	2.0	R	1.1	1.2	2.4	/	/	0.3	4.6	N	N	N	R	2.7	1.1	1.4	/	/	N	N	N	N	N	I	1.8	3.6	I
10	Mg (mg/L)	7.2	6.8	10.7	9.7	14.6	7.3	7.8	I	11.2	17.2	24.0			10.7	26.2	G	G	G	I	29.6	25.7	17.6			G	G	G	G	G	N	25.3	30.9	N
11	Na (mg/L)	28.0	43.0	51.9	43.0	73.3	74.8	85.2	V	21.6	150.0	115.0			147.0	216.7				V	224.4	170.6	91.4									243.4	243.4	
12	NH3-N (mg N/L)			0.05	0.56	0.38	0.25	0.49	E	0.56	0.83	0.34	P	P		0.47	C	C	C	E	0.72	0.31	0.27	P	P	C	C	C	C	C	2	1.15	0.28	2
13	NO2+NO3 (mg N/L)	0.21	0.77	2.74	2.38	3.09	3.70	4.86	R	2.21	1.18	0.68	O	O	3.40	8.61	O	O	O	R	5.30	0.80	0.98	O	O	O	O	O	O	O		5.30	0.26	
14	NO2-N (mgN/L)	0.04	0.05	0.06	0.04	0.04	0.10	0.10		0.08	0.07	0.12	O	O	0.06	0.62	N	N	N		0.04	0.01	0.05	O	O	N	N	N	N	N	M	0.07	0.02	M
15	NO3-N (mgN/L)	0.17	0.72	2.68	2.34	3.05	3.60	4.76	D	2.13	1.11	0.55	L	L	3.35	7.99	D	D	D	D	5.25	0.79	0.93	L	L	D	D	D	D	D	O	5.23	0.24	O
16	P-Tot (mgP/L)	0.010	0.045	0.020	0.065	0.065	0.050	0.090	R	0.070	0.080	0.080	I	I	0.030	0.080	I	I	I	R	0.085	0.095	0.075	I	I	I	I	I	I	I	N	0.100	0.110	N
17	SiO2 (mg/L)	11.0	28.3	29.0	33.3	23.2	26.5	38.4	Y	13.9	30.5	20.9	N	N	44.0	22.5	T	T	T	Y	38.0	28.3	27.0	N	N	T	T	T	T	T	T	44.7	29.7	T
18	SO4 (mg/L)	11.6	8.9	29.2	30.6	41.5	13.5	15.6		11.9	20.1	38.8	G	G	61.4	80.0	I	I	I		26.5	31.9	23.4	G	G	I	I	I	I	I	H	29.7	34.1	H
	BIOLOGICAL/BACTERIOLOGICAL																O	O	O							O	O	O	O	O	/			/
1	BOD3-27 (mg/L)	0.5	1.2	1.4	1.9	2.3	1.9	2.5		3.3	2.6	4.5	C	C	1.9	3.3	N	N	N		1.1	2.5	4.8	C	C	N	N	N	O	N		0.9	1.8	
2	Chlf-a (µg/L)											120.0	O	O			/	/	/					O	O	/	/	/	/	/	R			R
3	COD (mg/L)										33.1	64.3	N	N							212.8	62.3	25.0	N	N						D	49.2	9.0	D
4	DO (mg/L)	5.3	6.8	7.2	7.3	7.2	8.3	9.0		9.4	6.2	6.8	D	D	7.8	8.1	R	R	R		8.5	7.5	9.3	D	D	R	R	R	R	R		6.7	5.4	
5	DO_SAT% (%)	68	87	92	93	92	104	112		121	82	89	I	I	87	94	D	D	D		88	90	96	I	I	D	D	D	D	D		86	70	
6	FCol-MPN (MPN/100mL)										1433	363	T	T							61	2700	405	T	T							27	17	
7	Tcol-MPN (MPN/100mL)										15200	26482	I	I							21306	27100	760	I	I							13000	278	
	TRACE & TOXIC																																	
1	Al (mg/L)	0.02	0.06	0.07	0.05	0.02	0.03	0.03		0.03	0.08	0.05	O	O	0.02	0.03					0.06	0.05	0.05	O	O							0.07	0.06	
	CHEMICAL INDICES												N	N										N	N									
1	HAR_Ca (mgCaCO3/L)	82	78	136	116	154	114	186		82	184	126	/	/	184	253					265	166	170	/	/							241	185	
2	HAR_Total (mgCaCO3/L)	112	107	181	157	215	145	219		129	256	225			229	362					388	273	244									346	314	
3	Na% (%)	35	42	38	37	40	44	43		27	49	45	R	R	58	56					55	58	44	R	R							60	63	
4	RSC (-)	0.0	0.1	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	D	D	0.0	0.0					0.0	0.0	0.0	D	D							0.0	0.0	
5	SAR (-)	1.1	1.7	1.7	1.5	2.1	2.4	2.4		0.8	3.7	2.9			4.2	5.0					4.9	4.5	2.5									5.7	6.0	
	PESTICIDES																																	

7. TAPI BASIN

7.0 Tapi Basin

7.1 Basin description

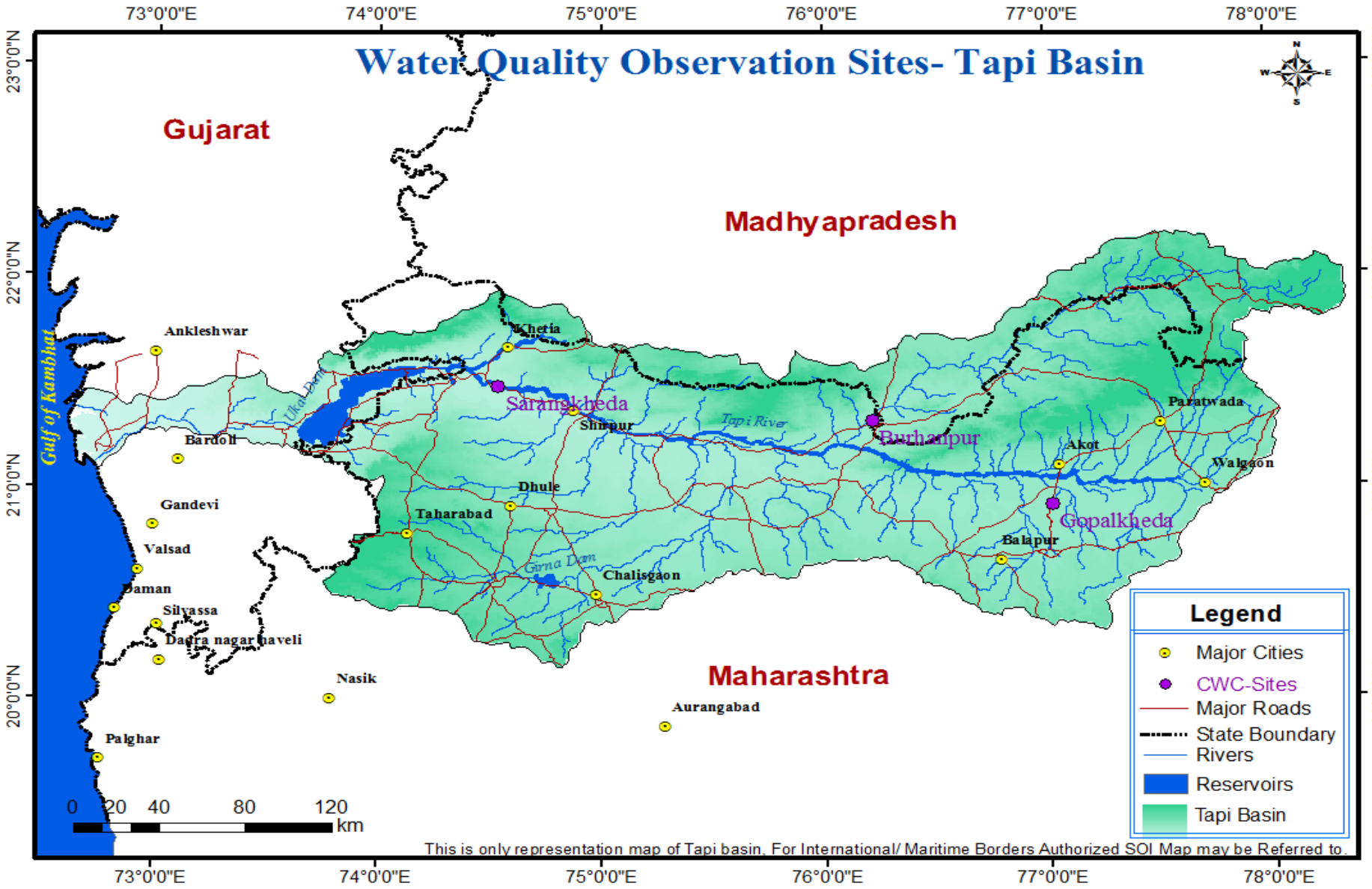
The Tapi is the second largest westward draining interstate river basin. Its basin map is enclosed. It originates near Multai in Betul district at an elevation of 752 m above *msl*. The total length of this west flowing river from its origin to its out- fall into gulf of Cambay is 724 km. It drains an area of 65,145 sq.km, out of which nearly 80% lies in Maharashtra, 15% in Madhya Pradesh and rest 5% in Gujarat .The Tapi basin is the northern most basin of Deccan Plateau and is situated between latitudes 20°N to 22°N approximately. The Satpura range forms its northern boundary and the Ajanta and Satmala hills forms its southern extremity. Mahadeo hills form its eastern boundary and its outlet into the Arabian sea is in the west. Bounded by three sides by the hill ranges, the river Tapi, along with its tributaries flows more or less over the plains of Vidarbha, Khandesh and Gujarat

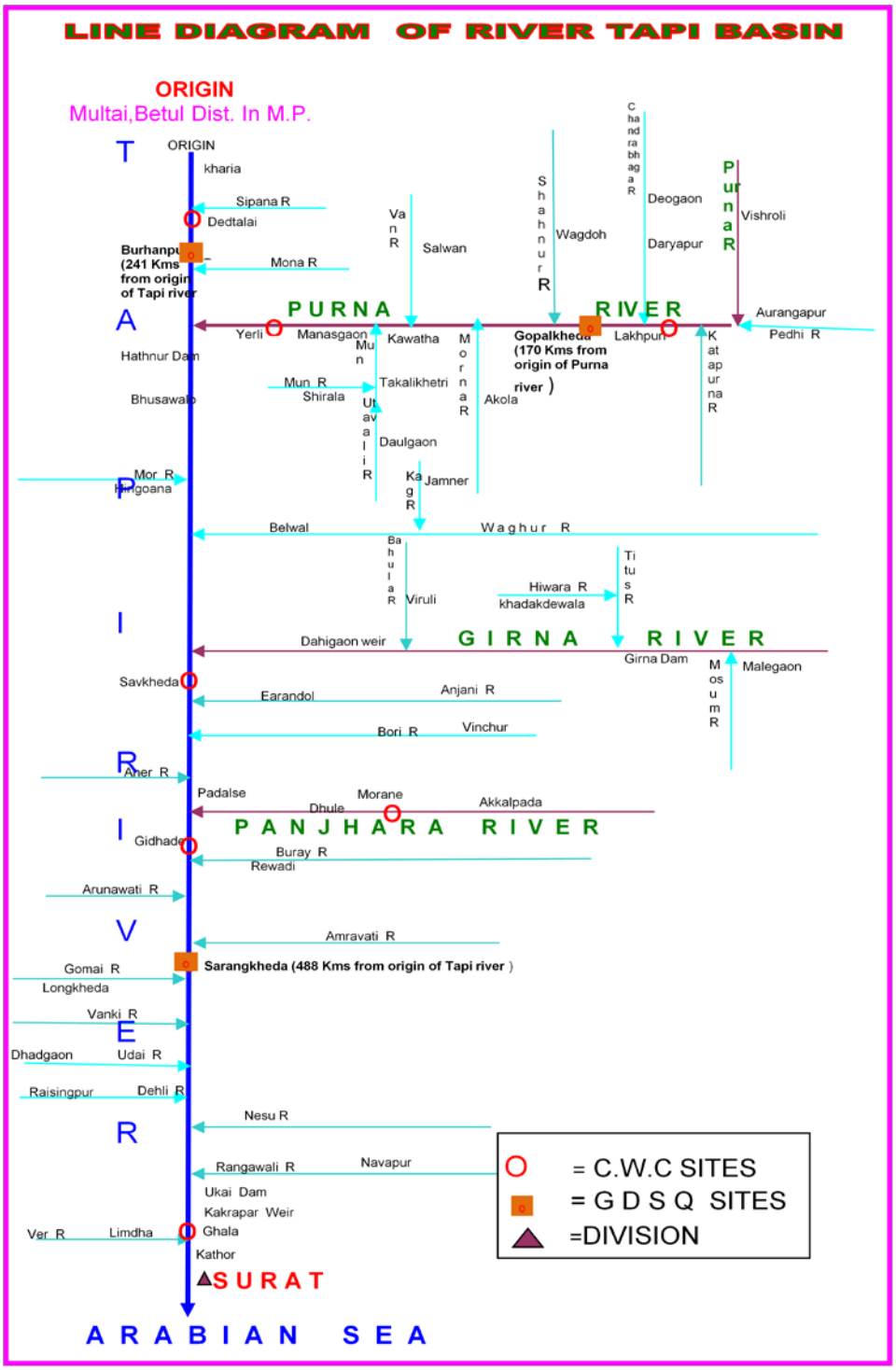
The Tapi receives several tributaries on both the banks. There are 14 major tributaries having length more than 50 km. Out of which 4 tributaries viz. Vaki, Gomi, Arunavati and Aner join on the right bank. Other 10 tributaries viz. Nesu, Amaravati, Buray, Panjhra, Bori, Girna, Vaghur, Purna, Mona and Sipna drain on left bank of the main channel. The drainage system on the left bank of Tapi is, therefore, more extensive as compared to the right bank area

The Purna and Girna, two important left bank tributaries, together account for nearly 45% of the total catchment area of the Tapi. The Purna is the principal tributary of the Tapi and originates in Betul district near Gawilgarh hills of Satpura range at an elevation of 900 m. It traverses 274 km having catchments area of about 18929 sq km. The Girna, another major tributary, rises in the hill ranges of Western Ghats at an elevation of 900 m. It traverses a distance of about 260 km having a catchment area about 10061 sq km.

The average rainfall in the Tapi basin is 830 mm, Owing to topographical characteristics, the climate is variable. The Purna Sub catchment in the upper half of the Tapi basin is one of the hottest regions in India

At present, there are 40 major and medium Irrigation schemes completed and 15 ongoing schemes in the form of reservoirs or weirs in the Tapi catchment. The main projects on main river are Kakrapar weir, Ukai Dam and Hathnur Dam. The upper Tapi Stage- II project is under progress at Nawtha.


Water Quality Observation Sites- Tapi Basin
Gujarat
Madhyapradesh
Maharashtra
Gulf of Kambhat
Ankleshwar
Bardoli
Gandevi
Valsad
Daman
Silvassa
Dadra nagar haveli
Palghar
Nasik
Aurangabad
Khetia
Saraipalkheda
Shirpur
Dhule
Taharabad
Chalisgaon
Burhanpur
Akot
Paratwada
Walgaon
Gopalkheda
Balapur
Ukai Dam
Tapi River
Girna Dam
73°0'0"E
74°0'0"E
75°0'0"E
76°0'0"E
77°0'0"E
78°0'0"E
23°0'0"N
22°0'0"N
21°0'0"N
20°0'0"N
0 20 40 80 120
km
Legend
Major Cities
CWC-Sites
Major Roads
State Boundary
Rivers
Reservoirs
Tapi Basin
This is only representation map of Tapi basin. For International/ Maritime Borders Authorized SOI Map may be Referred to.


LINE DIAGRAM OF RIVER TAPI BASIN
ORIGIN
Multai,Betul Dist. In M.P.
T
A
P
I
R
I
V
E
R
ORIGIN
kharia
Sipana R
Dedtalai
Burhanpur
(241 Kms from origin of Tapi river
Mona R
Va n R
Salwan
Shahnur R
Wagdoh
Chandrabhaga R
Deogaon
Daryapur
Purna R
Vishroli
PURNA RIVER
Aurangapur
Pedhi R
Yerli
Manasgaon
Mun
Kawatha
Gopalkheda (170 Kms from origin of Purna river)
Lakhpuri
Katapurna R
Hathnur Dam
Mun R
Shirala
Takalikhetri
Morna R
Akola
Bhusawal
Utavali R
Daulgaon
Mor R
Kangoana
Kag R
Jamner
Belwal
Waghur R
Bahula R
Viruli
Hiwara R
khadakdewala
Titus R
Dahigaon weir
GIRNA RIVER
Girna Dam
Malegaon
Mosum R
Savkheda
Earandol
Anjani R
Bori R
Vinchur
Aner R
Padalse
Morane
Dhule
Akkalpada
PANJHARA RIVER
Gidhade
Buray R
Rewadi
Arunawati R
Amravati R
Gomai R
Sarangkheda (488 Kms from origin of Tapi river)
Longkheda
Vanki R
Dhadgaon
Udai R
Raisingpur
Dehli R
Nesu R
Rangawali R
Navapur
Ukai Dam
Kakrapar Weir
Ver R
Limdha
Ghala
Kathor
SURAT
ARABIAN SEA
= C.W.C SITES
= G D S Q SITES
=DIVISION

7.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Tapi at Burhanpur**	**Code**	**:**	**01 02 17 002**
State	:	Madhya Pradesh	District		Khandwa
Basin	:	Tapi	Independent River	:	Tapi
Tributary	:	Tapi	Sub Tributary	:	Right
Sub-Sub Tributary	:		Local River	:	Tapi
Division	:	Tapi Div., Surat	Sub-Division	:	UTSD, Bhusawal
Drainage Area	:	8487 Sq. Km.	Bank	:	Right
Latitude	:	21°17'12" N	Longitude	:	76°30'18" E
		Opening Date	Closing Date		
Gauge	:	16/06/1972			
Discharge	:	14/09/1972			
Sediment	:	23/12/1972			
Water Quality	:	01/06/1977			

Water Quality Datasheet for the period : 2015-2016

Station Name: Tapi at Burhanpur (01 02 17002) | **River Water Analysis** | **Division: Tapi**

Local River: Tapi | **Sub-Division: UTSD, Bhusawal**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	137.2	338.4	66.40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear	Brown	Brown	Brown	Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)									927			
4	EC_GEN (µmho/cm)	465	300	345	477	450	360	535	618	310	340	430	420
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	9.0	7.0	8.0	7.0			7.0	7.0	7.0	8.2	8.0	7.0
7	pH_GEN (pH units)	8.1	8.3	8.1	8.0	8.0	7.8	7.8	8.2	8.2	8.3	8.2	8.2
8	SS (mg/L)	265	95	100	150	160	120	150	160	90	100	150	140
9	TDS (mg/L)	300	196	204	309	290	235	300	403	200	220	280	270
10	Temp (deg C)	28.0	26.0	25.0	29.0	24.0	25.0	24.0	19.0	21.0	24.0	26.0	36.0
11	TS (mg/L)		291	304		774	355		563	616	810	890	1100
12	Turb (NTU)	6.0	1.0	8.0		6.0	1.0	1.0	1.0	2.0	2.0	2.0	1.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	100	90	60	140	133	150	100	190	90	110	90	90
3	Ca (mg/L)	30	30	30	58	40	58	30	54	30	32	30	34
4	Cl (mg/L)	58.0	85.0	90.0	60.0	60.0	60.0	70.0	65.0	70.0	70.0	93.0	70.0
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	F (mg/L)	26466.00	0.10	0.13	0.12	0.14	0.13	0.13	0.13	0.14	0.14	0.13	0.11
7	HCO3 (mg/L)	122	110	73	171	162	183	122	232	110	134	110	110
8	K (mg/L)	4.0	4.8	4.0	4.2	4.2	4.0	3.8	5.6	3.8	3.6	3.8	3.6
9	Mg (mg/L)	8.5	5.0	3.7	2.4	13.4	5.0	6.1	15.8	6.1	9.7	8.5	6.1
10	Na (mg/L)	42.0	56.0	52.0	40.0	38.0	44.0	48.6	46.0	48.0	46.0	60.0	48.0
11	NH3-N (mg N/L)	0.12	0.06	0.12	0.12	0.12	0.14	0.11	0.13	0.13	0.11	0.11	0.08
12	NO2+NO3 (mg N/L)	0.17	0.12	0.18	0.28	0.18	0.20	0.23	0.20	0.18	0.19	0.18	0.15
13	NO2-N (mgN/L)	0.06	0.02	0.06	0.15	0.05	0.07	0.10	0.07	0.05	0.06	0.06	0.05
14	NO3-N (mgN/L)	0.11	0.10	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.10
15	P-Tot (mgP/L)	0.140	0.130	0.140	0.130	0.140	0.150	0.120	0.140	0.140	0.140	0.130	0.100
16	SiO2 (mg/L)	8.0	10.0	10.0	14.0	10.0	10.0	6.0	10.0	10.0	8.0	8.0	9.0
17	SO4 (mg/L)	11.2	3.0	5.0	10.0	10.0	10.0	8.0	10.0	10.0	9.0	10.0	12.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	1.1	0.6	0.5	0.4	1.6	0.5	0.8	1.6	2.6	1.4	2.5	3.0
2	COD (mg/L)	68.0	36.0	21.0	136.0	24.0	32.0	8.0	36.0	68.0	16.0	52.0	48.0
3	DO (mg/L)				6.3				9.8		4.6	8.3	
4	DO_SAT% (%)				82				106		55	102	
5	FCol-MPN (MPN/100mL)	800	400	600	400	500	400	1200	500	1300	300	3000	1200
6	Tcol-MPN (MPN/100mL)	1500	700	1200	700	1000	1000	2000	1200	2400	800	6000	2600
	TRACE & TOXIC												
1	Al (mg/L)	0.06	0.10	0.06	0.13	0.05	0.05	0.06	0.12	0.08	0.08	0.08	0.09
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	75	75	75	145	100	145	75	135	75	80	75	85
2	HAR_Total (mgCaCO3/L)	111	96	90	155	156	166	100	201	100	121	111	111
3	Na% (%)	44	54	54	35	34	36	50	33	50	45	53	48
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	1.7	2.5	2.4	1.4	1.3	1.5	2.1	1.4	2.1	1.8	2.5	2.0
	PESTICIDES												

Water Quality Summary for the period :2015-2016

Station Name : Tapi at Burhanpur (01 02 17 002) **Division: Tapi Division, Surat**
Local River: Tapi **Sub-Division: UTSD, Bhusawal**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	12938	0.000	128.8
2	EC_FLD (µmho/cm)	1	927	927	927
3	EC_GEN (µmho/cm)	12	618	300	421
4	pH_FLD (pH units)	10	9.0	7.0	7.5
5	pH_GEN (pH units)	12	8.3	7.8	8.1
6	SS (mg/L)	12	265	90	140
7	TDS (mg/L)	12	403	196	267
8	Temp (deg C)	12	36.0	19.0	25.6
9	TS (mg/L)	9	1100	291	634
10	Turb (NTU)	11	8.0	1.0	2.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	12	190	60	112
3	Ca (mg/L)	12	58	30	38
4	Cl (mg/L)	12	93.0	58.0	70.9
5	CO3 (mg/L)	12	0.0	0.0	0
6	F (mg/L)	12	0.14	0.10	0.13
7	HCO3 (mg/L)	12	232	73	137
8	K (mg/L)	12	5.6	3.6	4.1
9	Mg (mg/L)	12	15.8	2.4	7.5
10	Na (mg/L)	12	60.0	38.0	47.4
11	NH3-N (mg N/L)	12	0.14	0.06	0.11
12	NO2+NO3 (mg N/L)	12	0.28	0.12	0.19
13	NO2-N (mgN/L)	12	0.15	0.02	0.07
14	NO3-N (mgN/L)	12	0.13	0.10	0.12
15	P-Tot (mgP/L)	12	0.150	0.100	0.133
16	SiO2 (mg/L)	12	14.0	6.0	9.4
17	SO4 (mg/L)	12	12.0	3.0	9
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	3.0	0.4	1.4
2	COD (mg/L)	12	136.0	8.0	45.4
3	DO (mg/L)	4	9.8	4.6	7.3
4	DO_SAT% (%)	4	106	55	86
5	FCol-MPN (MPN/100mL)	12	3000	300	883
6	Tcol-MPN (MPN/100mL)	12	6000	700	1758
	TRACE & TOXIC				
1	Al (mg/L)	12	0.13	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	145	75	95
2	HAR_Total (mgCaCO3/L)	12	201	90	126
3	Na% (%)	12	54	33	45
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	2.5	1.3	1.9
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2016

Station Name: Tapi at Burhanpur (01 02 17 002) **River Water** **Division: Tapi Division, surat**

Local River: Tapi **Sub Division: UTSD, Bhusawal**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Q (cumec)	1139	611.0	371.4	79.94	93.12	340.6	358.6	528.7	1806	430.3	108.4	6.669	7.334	6.985	4.434	10.45	13.32	5.642	10.12	29.29	8.833	0.000	1.057	0.403	3.938	1.513	4.834	0.000	0.000	0.779	1.630	0.000	0.000
2	EC_FLD (µmho/cm)		866	221	225	290	420	291	214		280			895	373	400	399	305	370	294	500		927		463	526	247	132						
3	EC_GEN (µmho/cm)	588	392	363	424	414	667	322	272	532	651	407	379	776	568	550	397	403	498	473	518	556	456	951	623	617	593	520			533	617	495	397
4	pH_FLD (pH units)		7.0	8.0	8.0	8.0	8.1	8.2	7.5	7.8	7.5	7.8		7.5	7.0	7.7	7.4	7.8		8.0	7.7	8.0	7.0	7.0	8.1	7.9	8.0	8.7			8.0			7.7
5	pH_GEN (pH units)	8.6	7.9	8.2	7.4	7.6	8.3	7.5	7.6	8.2	8.3	8.1	8.5	8.1	8.1	7.7	7.5	8.3	7.0	7.8	7.9	8.2	8.0	8.1	8.7	7.8	8.0	8.2			8.1	8.2	8.0	8.2
6	SS (mg/L)	74	93	134	141	150	213	108	94	200	178	154	74	175	175	165	122	168	177	152	155	180	130	116	204	195	202	166			167	187	140	130
7	TDS (mg/L)	423	303	284	284	274	461	205	184	346	419	260	266	575	358	356	242	303	338	307	332	375	285	763	502	414	410	350			345	391	302	257
8	Temp (deg C)	28.	26.	27.	19.	27.	27.	29.	25.	25.	25.	26.	22.	24.	24.	18.	21.	24.	22.	19.	21.	17.	22.	26.	26.	21.	26.	24.			24.	24.	23.	28.
9	TS (mg/L)						674	313	291	579	597	456						470	514	476	487	555	511								511	578	449	933
1	Turb (NTU)						10.	12.	21.	5.2	11.	5.3						1.0	1.3	1.0	2.0	1.3	1.3								1.0	1.0	1.0	1.7
	CHEMICAL																																	
1	Alk-Phen	9.0	1.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	8.0	0.0	7.5	1.2	1.2	0.0	0.0	1.2	0.0	0.0	0.0	7.3	0.0	1.7	3.3	1.7	3.3	1.7			0.0	3.3	6.1	0.0
2	ALK-TOT (mgCaCO3/L)	246	168	238	184	228	119	78	92	90	100	105	270	196	217	207	120	127	87	82	92	124	133	430	220	183	287	107			98	96	112	97
3	Ca (mg/L)	37	32	32	33	33	33	32	32	32	32	38	32	33	33	33	32	34	35	31	32	35	43	33	34	33	34	33			30	33	35	32
4	Cl (mg/L)	100	19.	121	24.	107	79.	62.	58.	71.	74.	70.	31.	46.	54.	77.	58.	128	83.	73.	89.	71.	66.	130	56.	27.	207	115			61.	70.	61.	77.
5	CO3 (mg/L)	5.4	1.2	1.2	0.0	0.0	3.6	0.0	0.0	0.0	9.6	0.0	6.0	1.5	1.5	0.0	0.0	1.5	0.0	0.0	0.0	8.8	0.0	2.0	4.0	2.0	4.0	2.0			0.0	4.0	7.3	0.0
6	F (mg/L)	1.5	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	4.0	0.0	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.3	0.3			0.1	0.1	0.1	0.1
7	HCO3 (mg/L)	295	101	144	112	139	138	95	113	110	102	128	256	118	131	126	110	152	107	100	113	133	162	260	130	110	171	126			120	109	121	118
8	K (mg/L)		0.9	31.	0.7	15.	8.9	6.9	7.6	5.1	3.8	4.2		0.9	6.5	9.6	3.6	16.	10.	2.3	4.4	3.7	4.3	0.3	5.2	0.8	26.	7.7			2.9	3.6	3.9	3.7
9	Mg (mg/L)	9.3	7.0	8.4	6.8	10.	8.4	6.9	6.6	6.9	8.5	6.6	7.1	8.2	8.5	9.4	7.5	9.5	7.3	7.1	7.0	14.	8.2	10.	11.	7.1	11.	10.			7.4	8.0	12.	8.1
1	Na (mg/L)		11.	70.	14.	68.	53.	35.	36.	47.	50.	45.		33.	33.	47.	41.	87.	51.	47.	57.	47.	46.	259	32.	17.	140	78.			45.	49.	41.	51.
1	NH3-N (mg N/L)	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.2	0.2			0.1	0.1	0.1	0.1
1	NO2+NO3 (mg N/L)	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0			0.2		0.2	0.1
1	NO2-N (mgN/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0
1	NO3-N (mgN/L)	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0			0.1	0.1	0.1	0.1
1	o-PO4-P (mg P/L)						0.0	0.0	0.0									0.0	0.0	0.0														
1	P-Tot (mgP/L)	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.3	0.3	0.2	0.3	0.2	0.1	0.1	0.1	1.1	0.0	0.0	0.3	0.3			0.2	0.1	0.1	0.1
1	SiO2 (mg/L)	26.	23.	25.	24.	24.	21.	18.	9.3	9.2	9.5	10.	17.	17.	24.	21.	15.	20.	10.	9.0	8.5	8.5	9.0	18.	20.	23.	25.	14.			10.	10.	9.3	8.3
1	SO4 (mg/L)	17.	15.	7.0	12.	16.	8.9	15.	10.	10.	12.	7.8	24.	17.	11.	18.	18.	11.	15.	15.	11.	12.	9.5	30.	5.5	6.3	21.	20.			11.	11.	7.0	10.
	BIOLOGICAL/BACTERI																																	
1	BOD3-27 (mg/L)	11.	1.5	3.3	1.1	1.1	9.3	1.6	1.1	1.1	1.8	0.8	1.0	1.8	0.6	0.5	0.4	0.6	2.4	1.1	1.9	3.2	1.4	3.8	5.9	2.9	1.5	2.5			1.5	2.8	2.5	2.3
2	COD (mg/L)											57.										60.	36.										40.	38.
3	DO (mg/L)		7.2							7.2	7.3	6.3		7.3			7.0				6.6		9.8		5.5			6.0						6.5
4	DO_SAT% (%)		92							90	84	82		87			77				76		106		64			70						79
5	FCol-MPN										140	540									120	825	850									143	467	150
6	Tcol-MPN										298	102									580	167	165									340	103	313
	TRACE & TOXIC																																	
1	Al (mg/L)						0.1	0.1	0.1	0.0	0.0	0.0						0.0	0.0	0.1	0.1	0.0	0.0								0.1	0.1	0.0	0.0
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	91	79	80	83	83	83	80	79	79	81	94	80	82	83	81	80	84	87	78	80	88	108	83	85	81	85	83			75	82	88	80
2	HAR_Total	130	109	115	111	125	118	109	106	108	117	122	110	116	119	120	111	124	117	107	109	149	142	127	132	111	134	127			106	115	139	114
3	Na% (%)		15	44	22	44	33	38	39	46	48	44		31	35	40	44	56	46	49	52	40	42	81	28	25	63	55			48	47	41	48
4	RSC (-)	2.4	0.0	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.5	0.0			0.0	0.0	0.1	0.0
5	SAR (-)		0.5	2.9	0.6	2.6	2.2	1.5	1.5	2.0	2.0	1.9		1.4	1.4	1.8	1.7	3.4	2.1	2.0	2.4	1.7	1.8	9.8	1.2	0.7	5.3	3.1			1.9	2.0	1.6	2.1
	PESTICIDES																																	

POOLING CONDITION

POOLING CONDITION

Pesticides, Trace and Toxic element analysis

Station Name: Tapi at Burhanpur (01 02 17 002) **Division: Tapi Division, surat**

Local River: Tapi **Sub Division: UTSD, Bhusawal**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	RIVER DRY	0.0007	POOLING CONDITION	1.09	POOLING CONDITION	POOLING CONDITION	0.34	10.9	8.7	POOLING CONDITION	2.37	1.052	POOLING CONDITION			0.526	0.00027	0.00073	0.2618
2	Cd	Cadmium	microgram / l	-	-	0.75		0.0638		0.097			0.11	0.33	0.23		0.15	0		0.338	0.0110	1.000	0.00022	0.00014	0
3	Cr	Chromium	microgram / l	-	-	0		0		4.21			37.63	15.22	2.7		20.82	0		11.950	0.009	0.000	0.07511	0.00171	0
4	Cu	Copper	microgram / l	-	-	-		-		17.55			60.23	12.75	5.3		45.47	-		6.150	0.011	-	0.0249	0.00298	
5	Hg	Mercury	microgram / l	-	-	0		-		0.5			-	-	0.3		0.11	0.092		-	-	0.201	-		0
6	Ni	Nickel	microgram / l	-	-	9.35		0.00		-			5.4	27.45	11.6		9.2	0		0.750	0.008	3.450	0.00152	0.001	0
7	Pb	Lead	microgram / l	-	-	15.13		0.00		1.77			8.7	5.9	1.7		0.59	60.80		0.950	0.012	12.000	0.00093	0.0003	0
8	Zn	Zinc	microgram / l	-	-	22.82		42.17		172.2			88	51.7	4.30		0.02	30.60		0.010	0.005	3.000	0.00152	0.0127	9.67
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0		0.0041		-			-	-	-		-	-		-	-	-			
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	0.01		0.006		-			-	-	-		-	-		-	-	-			
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-		-		-			-	-	-		-	-		-	-	-			
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-		-		-			-	-	-		-	-		-	-	-			
5	D- BHC	D- BHC	microgram / l	-	-	-		-		-			-	-	-		-	-		-	-	-			
6	DDT	DDT	microgram / l	-	-	0.01		0.0054		-			-	-	-		-	-		-	-	-			
7	Dieldrin	Dieldrin	microgram / l	-	-	0		0.0042		-			-	-	-		-	-		-	-	-			
8	Endos-I	Endosulphan I	microgram / l	-	-	0.01		0.0293		-			-	-	-		-	-		-	-	-			
9	Endos-II	Endosulphan II	microgram / l	-	-	-		-		-			-	-	-		-	-		-	-	-			
10	Endos-s	Endosulphan s	microgram / l	-	-	-		-		-			-	-	-		-	-		-	-	-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Purna at Gopalkheda**	**Code**	**:**	**01 02 17 004**
State	:	Maharashtra	District		Akola
Basin	:	Tapi	Independent River	:	Tapi
Tributary	:	Purna	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Purna
Division	:	Surat	Sub-Division	:	Bhusawal
Drainage Area	:	9500 Sq. Km.	Bank	:	R.B.
Latitude	:	20°52'35" N	Longitude	:	76°59'14" E
		Opening Date	Closing Date		
Gauge	:	17/02/1977			
Discharge	:	17/02/1977			
Sediment	:	30/07/1979			
Water Quality	:	01/08/1979			

Water Quality Datasheet for the period : 2015-2016

Station Name: Purna at Gopalkheda (01 02 17004) | **River Water Analysis** | **Division: Tapi Division, Surat**

Local River: Purna | **Sub-Division: UTSD, Bhusawal**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	7.068	5.431	13.51	11.50			0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		Brown		Brown				Clear		Clear	
3	EC_FLD (µmho/cm)	270		530		540				450		440	
4	EC_GEN (µmho/cm)	odour free		odour free		odour free				odour free		odour free	
5	Odour_Code (-)	Tapi		8.3		8.3				7.3		8.2	
6	pH_FLD (pH units)	140		170		140				150		160	
7	pH_GEN (pH units)	180		300		340				290		290	
8	SS (mg/L)	29.0		27.0		27.0				20.0		27.0	
9	TDS (mg/L)			525		1200				1530		1900	
10	Temp (deg C)	1.0		6.0		1.0				2.0		1.0	
11	TS (mg/L)												
12	Turb (NTU)	0.0		0.0		0.0				0.0		0.0	
	CHEMICAL	110		90		170				100		100	
1	Alk-Phen (mgCaCO3/L)	32		32		50				32		32	
2	ALK-TOT (mgCaCO3/L)	110		70.0		50.0				67.0		60.0	
3	Ca (mg/L)	0.0		0.0		0.0				0.0		0.0	
4	Cl (mg/L)	0.14		0.12		0.11				0.13		0.14	
5	CO3 (mg/L)	134		110		207				122		122	
6	F (mg/L)	3.2		3.8		4.0				4.0		3.8	
7	HCO3 (mg/L)	9.7		7.3		13.4				6.1		3.7	
8	K (mg/L)	36.0		46.0		37.0				52.0		46.0	
9	Mg (mg/L)	0.14		0.11		0.10				0.12		0.10	
10	Na (mg/L)	29066.00		0.21		0.18				0.18		0.23	
11	NH3-N (mg N/L)	0.08		0.10		0.05				0.05		0.10	
12	NO2+NO3 (mg N/L)	0.13		0.11		0.13				0.13		0.13	
13	NO2-N (mgN/L)	0.140		0.140		0.150				0.150		0.140	
14	NO3-N (mgN/L)	1.0		6.0		10.0				8.0		10.0	
15	P-Tot (mgP/L)	13.0		10.0		22.0				10.0		10.0	
16	SiO2 (mg/L)												
17	SO4 (mg/L)	1.4		0.8		0.6				2.2		0.8	
	BIOLOGICAL/BACTERIOLOGICAL	28.0		12.0		16.0				52.0		28.0	
1	BOD3-27 (mg/L)	300		400		700				800		500	
2	COD (mg/L)	700		600		1400				1200		1200	
3	DO (mg/L)												
4	DO_SAT% (%)	0.08		0.08		0.07				0.11		0.09	
5	FCol-MPN (MPN/100mL)												
6	Tcol-MPN (MPN/100mL)	80		80		125				80		80	
	TRACE & TOXIC	121		110		181				105		95	
1	Al (mg/L)	39		47		30				51		50	
	CHEMICAL INDICES	0.0		0.0		0.0				0.0		0.1	
1	HAR_Ca (mgCaCO3/L)	1.4		1.9		1.2				2.2		2.1	
2	HAR_Total (mgCaCO3/L)												
3	Na% (%)												
4	RSC (-)												
5	SAR (-)												
	PESTICIDES												

Once in Two Months

Once in Two Months

River Dry

Once in Two Months

Once in Two Months

Once in Two Months

Water Quality Summary for the period :2015-2016

Station Name : Purna at Gopalkheda (01 02 17 004) **Division: Tapi Division, Surat**
Local River: Purna **Sub-Division: UTSD, Bhusawal**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	299	3598	0.000	36.75
2	EC_FLD (µmho/cm)	5			
3	EC_GEN (µmho/cm)	5	540	270	446
4	pH_FLD (pH units)	5			
5	pH_GEN (pH units)	5	8.3	7.3	8.1
6	SS (mg/L)	5	170	140	152
7	TDS (mg/L)	5	340	180	280
8	Temp (deg C)	5	29.0	20.0	26
9	TS (mg/L)	4	1900	525	1289
10	Turb (NTU)	5	6.0	1.0	2.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	5	170	90	114
3	Ca (mg/L)	5	50	32	36
4	Cl (mg/L)	5	70.0	47.0	58.8
5	CO3 (mg/L)	5	0.0	0.0	0
6	F (mg/L)	5	0.14	0.11	0.13
7	HCO3 (mg/L)	5	207	110	139
8	K (mg/L)	5	4.0	3.2	3.8
9	Mg (mg/L)	5	13.4	3.7	8
10	Na (mg/L)	5	52.0	36.0	43.4
11	NH3-N (mg N/L)	5	0.14	0.10	0.11
12	NO2+NO3 (mg N/L)	5	0.23	0.18	0.2
13	NO2-N (mgN/L)	5	0.10	0.05	0.08
14	NO3-N (mgN/L)	5	0.13	0.11	0.13
15	P-Tot (mgP/L)	5	0.150	0.140	0.144
16	SiO2 (mg/L)	5	10.0	1.0	7
17	SO4 (mg/L)	5	22.0	10.0	13
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	2.2	0.6	1.1
2	COD (mg/L)	5	52.0	12.0	27.2
3	FCol-MPN (MPN/100mL)	5	800	300	540
4	Tcol-MPN (MPN/100mL)	5	1400	600	1020
	TRACE & TOXIC				
1	Al (mg/L)	5	0.11	0.07	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	125	80	89
2	HAR_Total (mgCaCO3/L)	5	181	95	123
3	Na% (%)	5	51	30	43
4	RSC (-)	5	0.1	0.0	0
5	SAR (-)	5	2.2	1.2	1.8
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2016

Station Name: Purna at Gopalkheda (01 02 17 004) **River Water Analysis** **Division: Tapi Division, surat**

Local River: Purna **Sub Division: UTSD, Bhusawal**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Q (cumec)	487	37.	478	9.4	7.6	282	48.	158	277	26.		1.3	3.9	4.0	2.5	1.7	3.1	0.4	1.6	5.9	5.5	0.0	0.0		1.2		0.0	0.0	0.0	0.0	1.1	0.0	0.0
2	EC_FLD (µmho/cm)				492	730					250					164	638				130							110						
3	EC_GEN (µmho/cm)	556	281	554	108	639	465	571	335	500	959	447	791	987	136	208	833	108			146	700	450	645	805	119	258	122				800	500	440
4	pH_FLD (pH units)				7.3	8.1	7.2				7.4					8.4	8.1	7.2			8.0							7.7						
5	pH_GEN (pH units)	8.6	7.9	8.1	7.4	7.7	7.8	7.8	7.5	8.0	8.1	8.3	8.1	8.3	8.2	7.9	8.0	8.0			8.4	8.0	7.3	8.2	8.7	8.4	7.7	7.8				8.3	8.2	8.2
6	SS (mg/L)	75	98	157	243	252	157	185	114	167	306	150	77	232	262	488	242	401			465	210	150	79	266	318	528	402				220	200	160
7	TDS (mg/L)	415	190	444	736	418	316	369	210	303	641	273	634	859	808	131	504	795			930	460	290	441	652	804	181	814				500	400	290
8	Temp (deg C)	26.	26.	27.	26.	27.	27.	27.	18.	25.	26.	27.	22.	24.	19.	21.	17.	23.			20.	20.	20.	28.	31.	25.	28.	28.				25.	27.	27.
9	TS (mg/L)						473	554	324	469	946	863						119			144	670	153									720	600	190
1	Turb (NTU)						9.0	27.	10.	4.3	6.7	2.7						0.6			1.5	1.0	2.0									2.0	2.0	1.0
	CHEMICAL																																	
1	Alk-Phen	5.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	11.	0.0	0.0	5.0	2.5	0.0	2.5	0.0			5.0	11.	0.0	0.0	5.0	5.0	0.0	0.0				11.	14.	0.0
2	ALK-TOT (mgCaCO3/L)	137	207	237	184	213	80	87	77	88	110	123	305	170	215	175	115	110			116	93	100	360	210	150	220	100				109	118	100
3	Ca (mg/L)	33	32	32	34	34	32	36	30	31	35	38	32	32	34	33	32	35			33	24	32	32	32	35	35	34				32	52	32
4	Cl (mg/L)	127	16.	65.	76.	113	86.	135	105	76.	64.	55.	671	58.	50.	350	171	234			92.	60.	67.	114	23.	67.	650	200				60.	48.	60.
5	CO3 (mg/L)	3.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	14.	0.0	0.0	6.0	3.0	0.0	3.0	0.0			6.0	14.	0.0	0.0	6.0	6.0	0.0	0.0				14.	17.	0.0
6	F (mg/L)	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.2			0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.2				0.1	0.1	0.1
7	HCO3 (mg/L)	167	126	142	112	130	97	106	95	108	106	150	250	98	128	107	104	134			130	85	122	219	122	85	134	122				104	110	122
8	K (mg/L)		1.1	23.	1.8	6.1	8.8	14.	3.9	5.8	3.8	3.7		3.4	7.3	19.	5.8	10.			4.5	4.0	4.0		4.4	2.2	82.	6.3				4.0	4.2	3.8
9	Mg (mg/L)	9.1	8.7	7.8	8.5	10.	8.3	8.1	6.4	6.9	9.9	10.	8.3	7.8	8.3	9.5	7.8	8.9			7.8	7.3	6.1	6.8	7.8	8.7	9.7	10.				7.8	17.	3.7
1	Na (mg/L)		12.	40.	49.	73.	51.	77.	65.	50.	44.	39.		37.	31.	220	108	147			67.	46.	52.		16.	38.	376	135				46.	37.	46.
1	NH3-N (mg N/L)	0.1	0.6	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0			0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1				0.1	0.1	0.1
1	NO2+NO3 (mg N/L)	0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2			0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0					0.1	0.2
1	NO2-N (mgN/L)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.1
1	NO3-N (mgN/L)	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2			0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0				0.1	0.1	0.1
1	o-PO4-P (mg P/L)						0.0	0.0	0.0									0.0																
1	P-Tot (mgP/L)	0.5	0.4	0.0	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.1			0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.3				0.1	0.1	0.1
1	SiO2 (mg/L)	24.	21.	23.	27.	24.	14.	19.	9.0	8.3	9.3	5.7	18.	21.	27.	25.	16.	10.			10.	6.8	8.0	22.	22.	26.	25.	15.				8.0	10.	10.
1	SO4 (mg/L)	9.0	14.	5.1	26.	19.	4.1	12.	15.	10.	16.	15.	22.	5.9	10.	18.	16.	6.8			12.	10.	10.	13.	8.7	20.	20.	24.				14.	3.0	10.
	BIOLOGICAL/BACTERI																																	
1	BOD3-27 (mg/L)	1.4	0.4	2.9	7.7	1.8	0.8	1.6	0.7	1.4	1.6	0.9	4.0	6.5	7.0	9.3	1.3	5.5			1.9	3.5	2.2	0.6	2.0	6.0	5.0	11.				1.3	3.8	0.8
2	COD (mg/L)											18.										32.	52.										20.	28.
3	DO (mg/L)				7.7	7.7				7.0						7.7	6.6											5.9						
4	DO_SAT% (%)				95	97				83						94	65											75						
5	FCol-MPN										433	467									900	300	800									600	300	500
6	Tcol-MPN										100	900									250	800	120									140	700	120
	TRACE & TOXIC																																	
1	Al (mg/L)						0.1	0.1	0.0	0.0	0.1	0.0						0.1			0.0	0.1	0.1									0.1	0.1	0.0
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	81	80	79	86	84	80	89	75	77	88	95	80	80	86	83	80	86			83	60	80	80	80	88	88	85				80	129	80
2	HAR_Total	119	117	111	121	129	114	123	102	105	130	137	115	113	121	123	113	124			115	91	105	108	113	124	129	127				113	201	95
3	Na% (%)		18	37	46	53	33	55	55	48	42	39		41	34	76	65	70			54	51	51		24	40	78	68				46	28	50
4	RSC (-)	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.4			0.1	0.1	0.0	1.4	0.0	0.0	0.0	0.0				0.0	0.0	0.1
5	SAR (-)		0.5	1.7	2.0	2.8	2.0	3.1	2.8	2.1	1.7	1.5		1.6	1.2	8.7	4.4	5.8			2.8	2.1	2.2		0.7	1.5	14.	5.2				1.9	1.1	2.1
	PESTICIDES																																	

Pooling Condition / Sample not received

Pooling Condition / Sample not received

Pooling Condition

Pooling Condition

Pooling Condition

Pesticides, Trace and Toxic element analysis

Station Name: Purna at Gopalkheda (01 02 17 004) **Division: Tapi Division, surat**

Local River: Purna **Sub Division: UTSD, Bhusawal**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	0.2726	POOLING CONDITION	1.09	POOLING CONDITION	POOLING CONDITION	0.80	10.6	POOLING CONDITION	POOLING CONDITION	2.22	1.5419	POOLING CONDITION	-	-	2.900	0.00074	River Dry	0
2	Cd	Cadmium	microgram / l	-	-	1.51	3.59	0.0000		0.062			0.170	0.15			0.214	0.00		0.164	0.010	4.000	0.0001		0
3	Cr	Chromium	microgram / l	-	-	0	0	0		7.42			17.77	13.36			23.19	0		17.450	0.009	0.000	0.03681		0
4	Cu	Copper	microgram / l	-	-	-	-	-		28.54			36.14	10.77			40.89	-		9.750	0.014	-	0.00663		
5	Hg	Mercury	microgram / l	-	-	0	0	-		0.47			-	-			0.54	0.117		-	-	0.191			0
6	Ni	Nickel	microgram / l	-	-	18.28	11.59	1.04		-			2.30	20.17			18.4	0.00		1.260	0.035	14.320	0.00255		0
7	Pb	Lead	microgram / l	-	-	28.28	68.42	0.00		2.88			6.03	3.8			0.98	59.50		1.840	0.040	26.000	0.00099		0
8	Zn	Zinc	microgram / l	-	-	33.95	31.47	9.16		23.29			26.00	14.7			0.023	22.00		0.012	0.006	5.000	0.00255		11.29
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0	0	0		-			-	-			-	-		-		-			
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	0.04	0	0		-			-	-			-	-		-		-			
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	0	-		-			-	-			-	-		-		-			
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-	-	-		-			-	-			-	-		-		-			
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-		-			-	-			-	-		-		-			
6	DDT	DDT	microgram / l	-	-	0.01	-	0.0022		-			-	-			-	-		-		-			
7	Dieldrin	Dieldrin	microgram / l	-	-	0	-	0		-			-	-			-	-		-		-			
8	Endos-I	Endosulphan I	microgram / l	-	-	0.02	0.0004	0.1182		-			-	-			-	-		-		-			
9	Endos-II	Endosulphan II	microgram / l	-	-	-	0	-		-			-	-			-	-		-		-			
10	Endos-s	Endosulphan s	microgram / l	-	-	-		-		-			-	-			-	-		-		-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Tapi at Sarangkheda**	**Code**	**:**	**01 02 17 015**
State	:	Maharashtra	District		Nandurbar
Basin	:	Tapi	Independent River	:	Tapi
Tributary	:	TAPI	Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	Tapi
Division	:	Surat	Sub-Division	:	Dhule
Drainage Area	:	58400 Sq. Km.	Bank	:	Right
Latitude	:	21°25'55" N	Longitude	:	74°31'37" E
		Opening Date	Closing Date		
Gauge	:	29/07/1976			
Discharge	:	19/10/1977			
Sediment	:	13/07/1984			
Water Quality	:	01/01/1980			

Water Quality Datasheet for the period : 2015-2016

Station Name: Tapi at Sarangkheda (01 02 17015) | **River Water Analysis** | **Division: Tapi Division, Surat**

Local River: Tapi | **Sub-Division: MTSD, Dhule**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	272.8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear				Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	300						300		400		300	
4	EC_GEN (µmho/cm)	390				444		395		340		280	
5	Odour_Code (-)	odour free				odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	6.8						6.8		7.0		7.1	
7	pH_GEN (pH units)	8.1				8.0		8.2		7.3		8.3	
8	SS (mg/L)	150				140		130		50		100	
9	TDS (mg/L)	250				287		250		220		180	
10	Temp (deg C)	26.0				26.0		16.0		13.0		18.0	
11	TS (mg/L)					807				563		558	
12	Turb (NTU)	1.0				2.0				1.0		1.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0				0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)	75				147		74		100		115	
3	Mg (mg/L)	28				52		32		32		32	
4	Na (mg/L)	62.0				84.0		80.0		70.0		55.0	
5	CO3 (mg/L)	0.0				0.0		0.0		0.0		0.0	
6	F (mg/L)	0.14				0.15		0.14		0.14		0.14	
7	HCO3 (mg/L)	92	Once in Two Months	Pooling Condition	Once in Two Months	179	Once in Two Months	90	Once in Two Months	122	Once in Two Months	140	Once in Two Months
8	K (mg/L)	3.0				3.6		4.0		4.0		4.2	
9		6.1				13.4		7.3		9.7		9.7	
10		40.0				44.0		38.6		42.0		40.0	
11	NH3-N (mg N/L)	0.12				0.12		0.11		0.13		0.13	
12	NO2+NO3 (mg N/L)	0.24				0.20		0.18		0.24		0.21	
13	NO2-N (mgN/L)	0.12				0.06		0.06		0.10		0.08	
14	NO3-N (mgN/L)	0.12				0.14		0.12		0.14		0.13	
15	P-Tot (mgP/L)	0.130				0.130		0.140		0.140		0.130	
16	SiO2 (mg/L)	10.0				8.0		8.0		8.0		10.0	
17	SO4 (mg/L)	10.3				11.0		6.0		7.0		6.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	2.1				2.6		1.8		3.9		1.0	
2	COD (mg/L)	20.0				96.0		20.0		20.0		16.0	
3	DO (mg/L)	7.2						6.5		6.5		6.7	
4	DO_SAT% (%)	89						66		62		71	
5	FCol-MPN (MPN/100mL)	800				700		1000		2000		300	
6	Tcol-MPN (MPN/100mL)	1800				1400		1800		4000		500	
	TRACE & TOXIC												
1	Al (mg/L)	0.06				0.06		0.05		0.10		0.10	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	70				130		80		80		80	
2	HAR_Total (mgCaCO3/L)	95				186		111		121		121	
3	Na% (%)	47				34		42		42		41	
4	RSC (-)	0.0				0.0		0.0		0.0		0.0	
5	SAR (-)	1.8				1.4		1.6		1.7		1.6	
	PESTICIDES												

Water Quality Summary for the period :2015-2016

Station Name : Tapi at Sarangkheda (01 02 17 015) **Division: Tapi Division, Surat**
Local River: Tapi **Sub-Division: MTSD, Dhule**

River Water Summary

S.No	Parameters	Number of	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	7553	0.000	103.0
2	EC_FLD (µmho/cm)	4	400	300	325
3	EC_GEN (µmho/cm)	5	444	280	370
4	pH_FLD (pH units)	4	7.1	6.8	6.9
5	pH_GEN (pH units)	5	8.3	7.3	8
6	SS (mg/L)	5	150	50	114
7	TDS (mg/L)	5	287	180	237
8	Temp (deg C)	5	26.0	13.0	19.8
9	TS (mg/L)	3	807	558	643
10	Turb (NTU)	4	2.0	1.0	1.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	5	147	74	102
3	Ca (mg/L)	5	52	28	35
4	Cl (mg/L)	5	84.0	55.0	70.2
5	CO3 (mg/L)	5	0.0	0.0	0
6	F (mg/L)	5	0.15	0.14	0.14
7	HCO3 (mg/L)	5	179	90	125
8	K (mg/L)	5	4.2	3.0	3.8
9	Mg (mg/L)	5	13.4	6.1	9.2
10	Na (mg/L)	5	44.0	38.6	40.9
11	NH3-N (mg N/L)	5	0.13	0.11	0.12
12	NO2+NO3 (mg N/L)	5	0.24	0.18	0.21
13	NO2-N (mgN/L)	5	0.12	0.06	0.08
14	NO3-N (mgN/L)	5	0.14	0.12	0.13
15	P-Tot (mgP/L)	5	0.140	0.130	0.134
16	SiO2 (mg/L)	5	10.0	8.0	8.8
17	SO4 (mg/L)	5	11.0	6.0	8.1
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	3.9	1.0	2.3
2	COD (mg/L)	5	96.0	16.0	34.4
3	DO (mg/L)	4	7.2	6.5	6.7
4	DO_SAT% (%)	4	89	62	72
5	FCol-MPN (MPN/100mL)	5	2000	300	960
6	Tcol-MPN (MPN/100mL)	5	4000	500	1900
	TRACE & TOXIC				
1	Al (mg/L)	5	0.10	0.05	0.07
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	130	70	88
2	HAR_Total (mgCaCO3/L)	5	186	95	127
3	Na% (%)	5	47	34	41
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	1.8	1.4	1.6
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2016

Station Name: Tapi at Sarangkheda (01 02 17 015) **River Water** **Division: Tapi Division, surat**

Local River: Tapi **Sub Division: MTSD, Dhule**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Q (cumec)	178.9	1552	2676	336.9	270.0	913.0	420.5	566.5	485.8	446.0	54.5	1.685	23.70	10.96	0	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2	EC_FLD (µmho/cm)			380	370	188	270			325	305	300			334						300	300	350									400	300	300
3	EC_GEN (µmho/cm)	281	287	367	362	282	318	299	320	413	425	417		391	359						460	480	368		326							630	444	280
4	pH_FLD (pH units)			8.5	10.5	9.8	8.6	7.0	7.2	8.1	7.6	6.8			7.0						8.6	7.0	6.9									6.8	7.0	7.1
5	pH_GEN (pH units)	8.3	8.1	8.3	7.9	7.6	8.0	7.6	8.2	8.0	8.3	8.1		8.6	8.6						8.3	8.1	7.8		8.7							8.1	8.4	8.3
6	SS (mg/L)	66	86	110	146	102	122	90	98	150	130	145		144	109						150	150	90		98							200	120	100
7	TDS (mg/L)	186	192	294	237	184	215	168	210	269	277	269		295	222						314	320	235		229							399	286	180
8	Temp (deg C)	26.0	24.5	26.5	26.0	25.5	25.0	23.0	22.0	22.0	24.8	26.0		22.0	17.0						19.0	14.5	14.5		25.0							21.0	21.0	18.0
9	TS (mg/L)						337	258	308	419	407	807									464	470	563									599	406	558
10	Turb (NTU)						11.1	16.0	8.0	3.0	22.0	1.5									1.0	1.5	1.0									1.0	1.0	1.0
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	2.5	0.0	1.2	1.7	0.0	0.0	0.0	0.0	0.0	12.0	0.0		5.0	5.0						5.0	11.2	0.0		5.0							5.8	10.0	0.0
2	ALK-TOT (mgCaCO3/L)	120	170	222	170	190	112	66	95	90	109	111		170	210						95	96	87		190							112	148	115
3	Ca (mg/L)	32	32	32	32	32	31	30	32	31	35	40		32	32						32	26	32		32							36	26	32
4	Cl (mg/L)	15.3	14.4	57.0	46.5	59.1	55.6	104.0	68.8	71.3	60.5	73.0		2.3	56.1						98.0	62.3	75.0		6.9							58.0	65.0	55.0
5	CO3 (mg/L)	1.5	0.0	1.5	2.0	0.0	0.0	0.0	0.0	0.0	14.5	0.0		6.0	6.0						6.0	13.5	0.0		6.0							7.0	12.0	0.0
6	F (mg/L)	0.57	0.15	0.12	0.10	0.15	0.09	0.08	0.14	0.12	0.10	0.15		0.08	0.08						0.15	0.16	0.14		0.08							0.18	0.13	0.14
7	HCO3 (mg/L)	146	104	134	102	116	137	80	116	110	103	136		98	122						104	90	106		110							122	156	140
8	K (mg/L)		0.6	20.5	0.7	3.7	17.6	12.4	3.2	5.7	3.6	3.3		3.2	5.6						4.8	4.4	4.0		3.5							4.2	4.0	4.2
9	Mg (mg/L)	7.8	6.8	6.3	6.8	8.3	8.3	5.8	6.0	7.1	5.5	9.7		8.9	7.8						7.8	10.2	8.5		6.8							8.8	31.1	9.7
10	Na (mg/L)		8.8	34.9	27.7	38.8	36.0	58.7	45.0	44.6	44.1	42.0		1.3	40.7						70.0	43.5	40.3		4.0							40.0	40.0	40.0
11	NH3-N (mg N/L)	0.06	0.41	0.07	0.08	0.08	0.05	0.06	0.12	0.11	0.13	0.12		0.07	0.07						0.10	0.12	0.12		0.07							0.12	0.12	0.13
12	NO2+NO3 (mg N/L)	0.03	0.06	0.04	0.04	0.03	0.26	0.12	0.16	0.16	0.18	0.22		0.04	0.04						0.20	0.19	0.21		0.04								0.21	0.21
13	NO2-N (mgN/L)	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.04	0.05	0.06	0.09		0.00	0.00						0.10	0.08	0.08		0.00								0.10	0.08
14	NO3-N (mgN/L)	0.03	0.06	0.04	0.04	0.03	0.18	0.10	0.12	0.11	0.11	0.13		0.04	0.04						0.10	0.11	0.13		0.04							0.12	0.11	0.13
15	o-PO4-P (mg P/L)						0.07	0.09	0.05																									
16	P-Tot (mgP/L)	0.48	0.12	0.11	0.36	0.12	0.09	0.36	0.10	0.20	0.16	0.13		0.08	0.13						0.18	0.16	0.14		0.06							0.16	0.15	0.13
17	SiO2 (mg/L)	23.3	23.3	24.4	21.7	21.9	8.8	20.3	8.0	8.5	8.4	9.0		24.5	24.3						12.0	9.2	8.0		14.4							8.5	6.6	10.0
18	SO4 (mg/L)	12.0	14.3	4.1	11.3	13.4	1.2	10.0	7.0	11.4	6.0	10.7		16.3	2.9						16.6	14.2	6.5		6.1							12.0	10.0	6.0
	BIOLOGICAL/BACTERIOLOGICAL																																	
1	BOD3-27 (mg/L)	0.9	0.6	0.8	1.3	2.4	0.7	2.6	0.8	1.0	2.2	2.3		3.0	1.6						2.5	2.4	2.8		1.4							2.4	4.0	1.0
2	COD (mg/L)											58.0										24.0	20.0										21.0	16.0
3	DO (mg/L)			5.5	6.8	15.0	10.5			9.0	7.2	7.2			11.6						9.8	9.0	6.5									10.2	8.3	6.7
4	DO_SAT% (%)			69	83	184	129			103	86	89			17						106	88	64									114	93	71
5	FCol-MPN (MPN/100mL)										450	750									800	550	1500									700	800	300
6	Tcol-MPN (MPN/100mL)										1050	1600									2500	900	2900									1600	1700	500
	TRACE & TOXIC																																	
1	Al (mg/L)						0.06	0.05	0.10	0.13	0.09	0.06									0.08	0.08	0.08									0.10	0.10	0.10
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	80	80	80	80	80	78	75	80	78	88	100		80	80						80	65	80		80							90	64	80
2	HAR_Total (mgCaCO3/L)	112	108	106	108	114	113	99	105	108	111	141		117	113						112	108	116		108							127	194	121
3	Na% (%)		15	36	35	41	30	53	47	45	46	40		2	43						56	46	42		7							40	31	41
4	RSC (-)	0.3	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0		0.0	0.0						0.0	0.0	0.0		0.0							0.0	0.0	0.0
5	SAR (-)		0.4	1.5	1.2	1.6	1.5	2.6	1.9	1.9	1.8	1.6		0.1	1.7						2.9	1.8	1.6		0.2							1.5	1.3	1.6
	PESTICIDES																																	

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Pesticides, Trace and Toxic element analysis

Station Name: Tapi at Sarangkheda (01 02 17 015) **River Water** **Division: Tapi Division, surat**

Local River: Tapi **Sub Division: MTSD, Dhule**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	POOLING CONDITION	-	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	1.00	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	POOLING CONDITION	5.01	1.101	POOLING CONDITION	-	RIVER DRY	0.763	0.00004	0.0021	0.7043
2	Cd	Cadmium	microgram / l		-					0.157							0.552	0.00		0.246		1.000	0.00014	0	0
3	Cr	Chromium	microgram / l		-					5.5							17.01	0.00		11.570		0.000	0.02028	0.00064	0
4	Cu	Copper	microgram / l		-					23.38							32.51	-		12.270		-	0.00316	0.00063	
5	Hg	Mercury	microgram / l		-					0.54							0.21	0.093		-		0.150			0
6	Ni	Nickel	microgram / l		-					-							14.42	0.00		0.610		1.430	0.00436	0	0
7	Pb	Lead	microgram / l		-					4.74							0.95	69.30		0.600		11.000	0.00119	0	0
8	Zn	Zinc	microgram / l		-					32.29							0.15	43.70		0.014		0.000	0.00436	0.0054	13.62
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l		-					-							-	-		-		-			
2	Alpha-BHC	Alpha- BHC	microgram / l		-					-							-	-		-		-			
3	Beta-BHC	Beta-BHC	microgram / l		-					-							-	-		-		-			
4	Gama-BHC	gamma-BHC (Benzene	microgram / l		-					-							-	-		-		-			
5	D- BHC	D- BHC	microgram / l		-					-							-	-		-		-			
6	DDT	DDT	microgram / l		-					-							-	-		-		-			
7	Dieldrin	Dieldrin	microgram / l		-					-							-	-		-		-			
8	Endos-I	Endosulphan I	microgram / l		-					-							-	-		-		-			
9	Endos-II	Endosulphan II	microgram / l		-					-							-	-		-		-			
10	Endos-s	Endosulphan s	microgram / l		-					-							-	-		-		-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

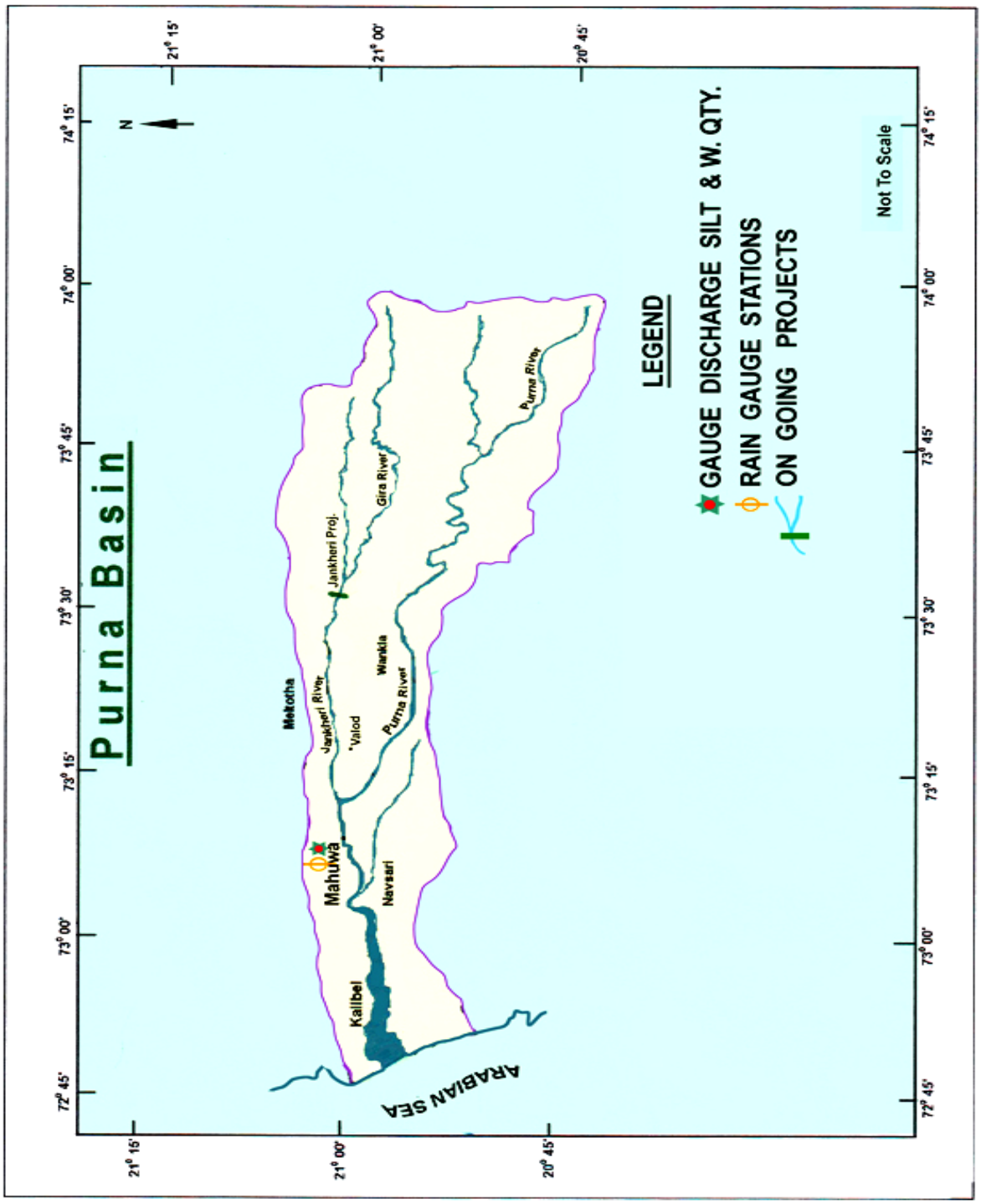
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

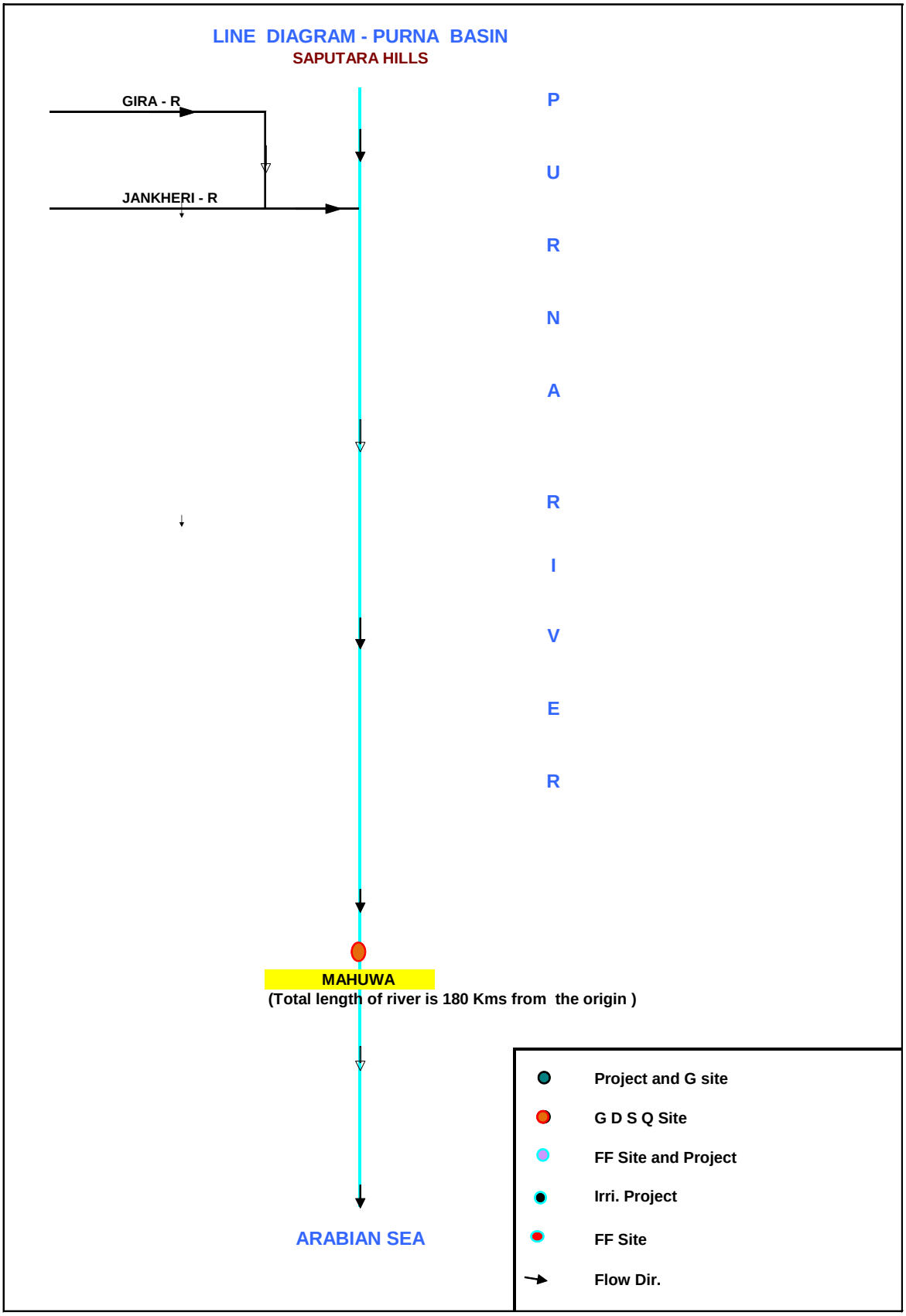
8. PURNA BASIN

8.0 Purna Basin

8.1 Basin description

The river Purna is one of the important west flowing rivers in Gujarat state. Its basin map is enclosed. It originates from Saputara hill ranges and after flowing in Dang, Valsad and Surat districts of Gujarat state for a length of 142-km falls into the Arabian sea. The catchment area of the Purna basin is 2431 sq.km. It lies between 72^0 45' and 74^0 east longitudes and 20^0 40' and 21^0 15' north latitudes. It has only one main tributary namely Jankhari.




LINE DIAGRAM - PURNA BASIN
SAPUTARA HILLS
GIRA - R
JANKHERI - R
P
U
R
N
A
R
I
V
E
R
MAHUWA
(Total length of river is 180 Kms from the origin)
ARABIAN SEA
Project and G site
G D S Q Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

8.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Purna at Mahuwa**	**Code**	**:**	**01 02 19 001**
State	:	Gujarat	District		Surat
Basin	:	WFR South of Tapi	Independent River	:	Purna
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	
Division	:	Tapi Division, Surat	Sub-Division	:	LTSD,CWC,Surat
Drainage Area	:	1995 Sq. Km.	Bank	:	Left
Latitude	:	21°00'52" N	Longitude	:	73°08'25" E
		Opening Date	Closing Date		
Gauge	:	04/10/1970			
Discharge	:	12/11/1970			
Sediment	:	18/06/1973			
Water Quality	:	15/06/1977			

Water Quality Datasheet for the period : 2015-2016

Station Name: Purna at Mahuwa (01 02 19 001) — **Division: Tapi Division, Surat**

Local River: Purna — **River Water Analysis** — **Sub Division: LTSD, Surat**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	56.58	2.028	5.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000
T w o	T w o	T w o	Once in Two Months	T w o	Once in Two Months	T w o	Once in Two Months	T w o	Once in Two Months	T w o	Once in Two Months	T w o	Once in Two Months
3	EC_FLD (µmho/cm)	372											
4	EC_GEN (µmho/cm)	470		310		190		500		480		500	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	7.8		8.0		7.8		7.5		7.0		7.0	
7	pH_GEN (pH units)	8.1		8.0		8.0		8.2		8.2		8.1	
8	SS (mg/L)	195		90		60		190		160		110	
9	TDS (mg/L)	300		198		120		320		310		310	
10	Temp (deg C)	28.0		27.0		26.0		25.0		22.0		23.0	
11	TS (mg/L)			288		1031				1075		604	
12	Turb (NTU)	1.0		4.0		3.0		2.0		1.0		2.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0		0.0		0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)	130		84		115		82		80		110	
3	Ca (mg/L)	34		36		28		36		38		36	
4	Cl (mg/L)	68.0		90.0		60.0		85.0		85.0		65.0	
5	CO3 (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
6	F (mg/L)	0.14		0.09		0.14		0.12		0.13		0.14	
7	HCO3 (mg/L)	159		102		140		100		98		134	
8	K (mg/L)	4.0		3.2		4.6		4.2		4.2		4.4	
9	Mg (mg/L)	10.9		10.9		12.2		9.7		6.1		7.3	
10	Na (mg/L)	52.0		48.0		46.0		44.0		46.0		44.0	
11	NH3-N (mg N/L)	0.12		0.08		0.14		0.11		0.11		0.12	
12	NO2+NO3 (mg N/L)	0.23		0.15		0.22		0.18		0.14		0.21	
13	NO2-N (mgN/L)	0.10		0.05		0.08		0.05		0.04		0.10	
14	NO3-N (mgN/L)	0.13		0.10		0.14		0.13		0.10		0.11	
15	P-Tot (mgP/L)	0.100		0.130		0.140		0.120		0.120		0.140	
16	SiO2 (mg/L)	8.0		6.0		10.0				8.0		6.0	
17	SO4 (mg/L)	10.1		10.0		7.0		12.0		6.0		6.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	0.7		1.2		1.4				1.6		1.8	
2	COD (mg/L)	68.0		12.0		112.0				40.0		8.0	
3	DO (mg/L)	8.2		6.4		6.5		6.9		6.7		6.9	
4	DO_SAT% (%)	105		80		80		84		77		80	
5	FCol-MPN (MPN/100mL)	300		300		1000		1600		1000		1500	
6	Tcol-MPN (MPN/100mL)	800		800		2200		3600		2000		3400	
	TRACE & TOXIC												
1	Al (mg/L)	0.12		0.10		0.08		0.10		0.11		0.10	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	85		90		70		90		95		90	
2	HAR_Total (mgCaCO3/L)	131		136		121		131		121		121	
3	Na% (%)	46		43		44		41		44		43	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	2.0		1.8		1.8		1.7		1.8		1.7	
	PESTICIDES												

Water Quality Summary for the period 2015-2016

Station Name : Purna at Mahuwa (01 02 19 001) **Division: Tapi Division, Surat**

Local River: Purna **Sub-Division: LTSD, Surat**

River Water Summary

S.No	Parameters	Number of	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	548.0	0.000	7.777
2	EC_FLD (µmho/cm)	1	372	372	372
3	EC_GEN (µmho/cm)	6	500	190	408
4	pH_FLD (pH units)	6	8.0	7.0	7.5
5	pH_GEN (pH units)	6	8.2	8.0	8.1
6	SS (mg/L)	6	195	60	134
7	TDS (mg/L)	6	320	120	260
8	Temp (deg C)	6	28.0	22.0	25.2
9	TS (mg/L)	4	1075	288	750
10	Turb (NTU)	6	4.0	1.0	2.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	130	80	100
3	Ca (mg/L)	6	38	28	35
4	Cl (mg/L)	6	90.0	60.0	75.5
5	CO3 (mg/L)	6	0.0	0.0	0
6	F (mg/L)	6	0.14	0.09	0.13
7	HCO3 (mg/L)	6	159	98	122
8	K (mg/L)	6	4.6	3.2	4.1
9	Mg (mg/L)	6	12.2	6.1	9.5
10	Na (mg/L)	6	52.0	44.0	46.7
11	NH3-N (mg N/L)	6	0.14	0.08	0.11
12	NO2+NO3 (mg N/L)	6	0.23	0.14	0.19
13	NO2-N (mgN/L)	6	0.10	0.04	0.07
14	NO3-N (mgN/L)	6	0.14	0.10	0.12
15	P-Tot (mgP/L)	6		0.100	0.125
16	SiO2 (mg/L)	5	10.0	6.0	7.6
17	SO4 (mg/L)	6	12.0	6.0	8.5
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	1.8	0.7	1.3
2	COD (mg/L)	5	112.0	8.0	48
3	DO (mg/L)	6	8.2	6.4	6.9
4	DO_SAT% (%)	6	105	77	84
5	FCol-MPN (MPN/100mL)	6	1600	300	950
6	Tcol-MPN (MPN/100mL)	6	3600	800	2133
	TRACE & TOXIC				
1	Al (mg/L)	6	0.12	0.08	0.1
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	95	70	87
2	HAR_Total (mgCaCO3/L)	6	136	121	127
3	Na% (%)	6	46	41	44
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.0	1.7	1.8
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2016

Station Name : Purna at Mahuwa (01 02 19 001) — **Division: Tapi Division, Surat**

Local River: Purna — **River Water Analysis** — **Sub-Division: LTSD, Surat**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	804.	122.	646.	35.4	23.3	61.6	84.7	159.	54.1	80.1	12.7	4.27	4.56	4.64	5.80	2.15	5.09	1.65	3.09	3.43	0.00	0.00	1.70	2.11	2.56	2.70	0.00	0.18	0.32	1.26	0.00	0.00	0.00
2	EC_FLD (µmho/cm)		214	306	272	371	292		395		240	372	413	400	447	451	363	425				438		418	362	382	435						438	
3	EC_GEN (µmho/cm)	293	230	375	392	440	432	376	399	388	372	323	395	463	664	505	400	432	532	325	538	400	490	443	499	460	443			600		780	1016	500
4	pH_FLD (pH units)		8.1	8.2	7.0	7.0	7.0		7.0	7.0	8.0	7.9	8.0	8.3	7.8	7.0	7.0	7.6	7.0	7.2	8.2	7.0	7.3	7.1	8.2	7.7	7.0			7.0			7.0	7.0
5	pH_GEN (pH units)	8.2	8.3	8.4	7.4	8.0	7.6	7.4	7.5	8.0	8.2	8.0	8.3	8.3	8.0	7.9	7.8	8.1	7.3	8.1	7.9	7.7	8.2	8.2	8.6	8.3	8.3			7.6		6.8	7.8	8.1
6	SS (mg/L)	65	101	158	138	175	163	128	153	138	129	115	77	132	179	188	154	152	185	129	163	130	175	85	121	117	176			170		220	300	110
7	TDS (mg/L)	204	155	288	264	292	312	220	278	255	245	206	275	342	383	319	265	294	324	260	347	303	315	294	364	306	309			500		505	684	310
8	Temp (deg C)	29.2	27.0	21.4	28.0	29.2	29.0	27.5	28.0	27.3	28.0	27.0	21.5	20.5	21.0	21.5	22.0	24.0	20.5	22.0	23.0	23.5	23.5	25.0	29.0	26.0	23.0			21.5		26.0	26.0	23.0
9	TS (mg/L)						475	367	432	485	374	660						445	508	389	510	433	1075							516		725	984	604
10	Turb (NTU)						1.7	16.5	10.3	3.0	2.7	2.7						1.5	1.5	1.0	2.0	2.0	1.5							2.0		1.0	1.0	2.0
	CHEMICAL																																	
1	Alk-Phen (mgCaCO3/L)	2.0	2.5	5.0	1.7	1.7	0.0	0.0	0.0	0.0	5.8	0.0	2.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0	2.5	14.5	0.0	0.0	5.0	0.0	5.0			0.0		5.8	28.2	0.0
2	ALK-TOT (mgCaCO3/L)	150	174	223	183	190	101	92	92	72	100	110	305	165	175	260	110	90	75	76	99	121	81	440	230	200	190			90		110	180	110
3	Ca (mg/L)	32	31	32	33	32	31	33	33	28	35	33	32	32	32	33	32	32	31	34	32	38	37	32	34	32	32			34		38	34	36
4	Cl (mg/L)	22.4	10.5	59.4	30.2	159.	90.0	90.7	188.	79.0	76.0	72.7	72.5	33.7	45.6	100.	60.1	137.	96.4	93.7	98.5	65.2	85.0	52.1	10.1	23.2	204.			220.		68.0	68.0	65.0
5	CO3 (mg/L)	1.3	3.0	6.0	2.0	2.0	0.0	0.0	0.0	0.0	7.0	0.0	1.5	3.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	17.5	0.0	0.0	6.0	0.0	6.0			0.0		7.0	34.0	0.0
6	F (mg/L)	0.05	0.06	0.09	0.07	0.08	0.07	0.07	0.17	0.13	0.11	0.12	0.13	0.05	0.05	0.19	0.14	0.07	0.08	0.10	0.14	0.18	0.12	0.22	0.05	0.05	0.22			0.14		0.14	0.14	0.14
7	HCO3 (mg/L)	183	103	130	110	114	123	112	112	87	108	134	256	98	104	158	134	110	91	93	115	113	99	268	134	122	110			110		120	150	134
8	K (mg/L)		0.2	14.9	0.2	19.9	9.5	11.5	5.1	2.8	4.1	3.9		0.7	3.9	18.2	2.3	4.8	4.0	3.6	4.4	4.2	4.2		4.0	0.3	26.0			8.8		3.6	3.6	4.4
9	Mg (mg/L)	7.8	7.3	8.1	6.1	7.8	7.2	7.2	6.9	7.9	6.5	11.4	8.3	7.8	7.8	8.7	7.8	8.5	9.0	8.0	9.6	9.9	7.9	7.8	8.7	6.8	8.7			6.6		8.0	16.8	7.3
10	Na (mg/L)		6.0	36.0	17.5	95.8	64.1	53.5	122.	47.7	49.1	48.7		18.5	25.8	71.7	43.4	98.0	52.0	58.8	64.0	43.4	45.0		7.4	15.1	118.			132.		48.0	48.2	44.0
11	NH3-N (mg N/L)	0.05	0.14	0.08	0.06	0.07	0.05	0.06	0.10	0.09	0.12	0.11	0.13	0.05	0.05	0.06	0.05	0.07	0.10	0.07	0.13	0.14	0.11	0.19	0.05	0.05	0.18			0.10		0.18	0.11	0.12
12	NO2+NO3 (mg N/L)	0.15	0.04	0.04	0.03	0.03	0.15	0.12	0.18	0.19	0.20	0.20	0.06	0.02	0.02	0.04	0.03	0.11	0.14	0.14	0.22	0.21	0.16	0.08	0.01	0.01	0.06			0.12			0.21	0.21
13	NO2-N (mgN/L)	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.04	0.06	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.04	0.10	0.06	0.04	0.00	0.00	0.00	0.00			0.01			0.08	0.10
14	NO3-N (mgN/L)	0.15	0.04	0.04	0.03	0.03	0.11	0.10	0.14	0.14	0.13	0.12	0.06	0.02	0.02	0.04	0.03	0.08	0.11	0.10	0.13	0.15	0.11	0.08	0.01	0.01	0.06			0.11		0.14	0.13	0.11
15	o-PO4-P (mg P/L)						0.04	0.08	0.08									0.05	0.05	0.05										0.16				
16	P-Tot (mgP/L)	0.41	0.08	0.10	0.30	0.12	0.09	0.32	0.13	0.18	0.16	0.12	0.14	0.05	0.17	0.13	0.08	0.09	0.32	0.45	0.20	0.22	0.12	0.16	0.04	0.03	0.22			0.36		0.20	0.13	0.14
17	SiO2 (mg/L)	21.3	22.5	20.0	23.6	19.0	12.2	8.8	12.0	6.4	9.8	8.0	14.3	14.3	22.3	16.6	12.8	16.4	15.1	13.0	8.4	8.4	8.0	14.9	15.1	20.2	18.3			8.0		7.2	10.0	6.0
18	SO4 (mg/L)	23.5	7.9	3.4	5.7	15.4	6.4	7.8	9.4	11.6	8.3	9.0	20.3	13.7	9.0	14.8	12.1	10.4	7.4	19.2	15.3	8.4	9.0	23.9	4.2	4.0	14.4			10.0		15.0	10.0	6.0
	BIOLOGICAL/BACTERIOLO																																	
1	BOD3-27 (mg/L)	0.5	0.4	0.6	0.5	1.1	0.4	0.7	0.7	0.7	1.1	1.1	0.7	0.8	1.0	0.6	0.4	1.4	0.7	1.3	1.7	1.7	1.6	0.4	1.6	2.1	0.7			0.5		3.3	4.4	1.8
2	COD (mg/L)											64.0										20.0	40.0										34.0	8.0
3	DO (mg/L)		6.0	6.7	8.8	7.3	7.8		8.0	7.4	6.8	7.0		6.6		5.3	7.2	9.0			7.2	7.7	6.8		6.6	6.2	5.0						6.0	6.9
4	DO_SAT% (%)		76	94	111	95	100		103	93	88	88		73		59	82	103			87	92	80		86	76	58						74	80
5	FCol-MPN (MPN/100mL)										550	533									1000	175	1300									1600	500	1500
6	Tcol-MPN (MPN/100mL)										1133	1267									2200	400	2800									3800	1500	3400
	TRACE & TOXIC																																	
1	Al (mg/L)						0.05	0.08	0.12	0.07	0.10	0.10						0.06	0.14	0.09	0.09	0.09	0.11							0.08		0.18	0.06	0.10
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	80	78	80	81	80	78	83	82	70	88	82	80	80	80	82	80	80	78	85	80	94	93	80	84	80	80			85		95	86	90
2	HAR_Total (mgCaCO3/L)	113	109	114	107	113	108	112	110	103	115	129	115	113	112	118	113	115	115	118	120	135	126	113	120	108	116			113		129	156	121
3	Na% (%)		11	37	26	51	49	48	57	48	47	44		21	31	48	45	61	49	51	53	40	43		11	23	63			70		44	40	43
4	RSC (-)	1.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0			0.0		0.0	0.5	0.0
5	SAR (-)		0.3	1.5	0.7	3.9	2.7	2.2	5.1	2.0	2.0	1.9		0.8	1.1	2.9	1.8	4.0	2.1	2.4	2.5	1.6	1.8		0.3	0.6	4.8			5.5		1.8	1.7	1.7
	PESTICIDES																																	

Once in 2 months / Sample not received

Once in 2 months / Sample not received

Pesticides, Trace and Toxic element analysis

Station Name: Purna at Mahuwa (01 02 19 001)
Local River: Purna

Division: Tapi Division, surat
Sub Division: LTSD, Surat

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	0.195	POOLING CONDITION	1.07	2.84	0.5245	0.81	9.99	11.21	POOLING CONDITION	7.12	0.7299	POOLING CONDITION	-	-	0.049	0.00036	0.00111	0.6285
2	Cd	Cadmium	microgram / l	-	-	0.73	1.91	0.000		0.051	0.06	0.260	0.22	0.16	0.1000		0.1260	0.000		0.254	0.005	16.000	0.00008	0.00036	0
3	Cr	Chromium	microgram / l	-	-	0	0	0.000		5.41	9.18	0.000	9.60	4.25	1.21		14.31	0.000		9.440	0.008	0.000	0.1356	0.00301	0
4	Cu	Copper	microgram / l	-	-	-	-	-		18.46	32.42	-	3.98	8.31	7.99		20.47	-		3.710	0.012	-	0.01147	0.00301	
5	Hg	Mercury	microgram / l	-	-	0	-	-		0.52	-	0.1075	-	-	0.98		0.54	0.137		-	-	0.021			0.233
6	Ni	Nickel	microgram / l	-	-	8.23	0.00	1.077		-	10.50	0.490	9.20	6.9	25.68		89.91	0.000		0.700	0.017	64.280	0.00205	0.00346	0
7	Pb	Lead	microgram / l	-	-	13.42	28.42	0.000		1.54	3.34	22.16	5.28	2.39	2.23		0.97	59.800		0.740	0.019	59.000	0.00025	0.00376	0
8	Zn	Zinc	microgram / l	-	-	33.41	18.01	7.615		16.06	11.90	32.14	44.00	13.69	4.10		0.01	35.400		0.011	0.005	17.000	0.00205	0.1318	7.87
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0	0.0028	0.000		-	-	0.0024	-	-	-		-	-		-	-				
2	Alpha- BHC	Alpha- BHC	microgram / l	-	-	0.01	0.0193	0.000		-	-	0.0300	-	-	-		-	-		-	-				
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	-	-		-	-	-	-	-	-		-	-		-	-				
4	Gama- BHC	gamma-BHC (Benzene Hexachloride)	microgram / l	-	-	-	-	-		-	-	-	-	-	-		-	-		-	-				
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-		-	-	-	-	-	-		-	-		-	-				
6	DDT	DDT	microgram / l	-	-	0	0	0.000		-	-	0.0065	-	-	-		-	-		-	-				
7	Dieldrin	Dieldrin	microgram / l	-	-	0	0.0009	0.0025		-	-	0.0001	-	-	-		-	-		-	-				
8	Endos-I	Endosulphan I	microgram / l	-	-	0.02	0.0098	0.1056		-	-	0.0250	-	-	-		-	-		-	-				
9	Endos-II	Endosulphan II	microgram / l	-	-	-	-	-		-	-	-	-	-	-		-	-		-	-				
10	Endos-s	Endosulphan s	microgram / l	-	-	-	-	-		-	-	-	-	-	-		-	-		-	-				

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

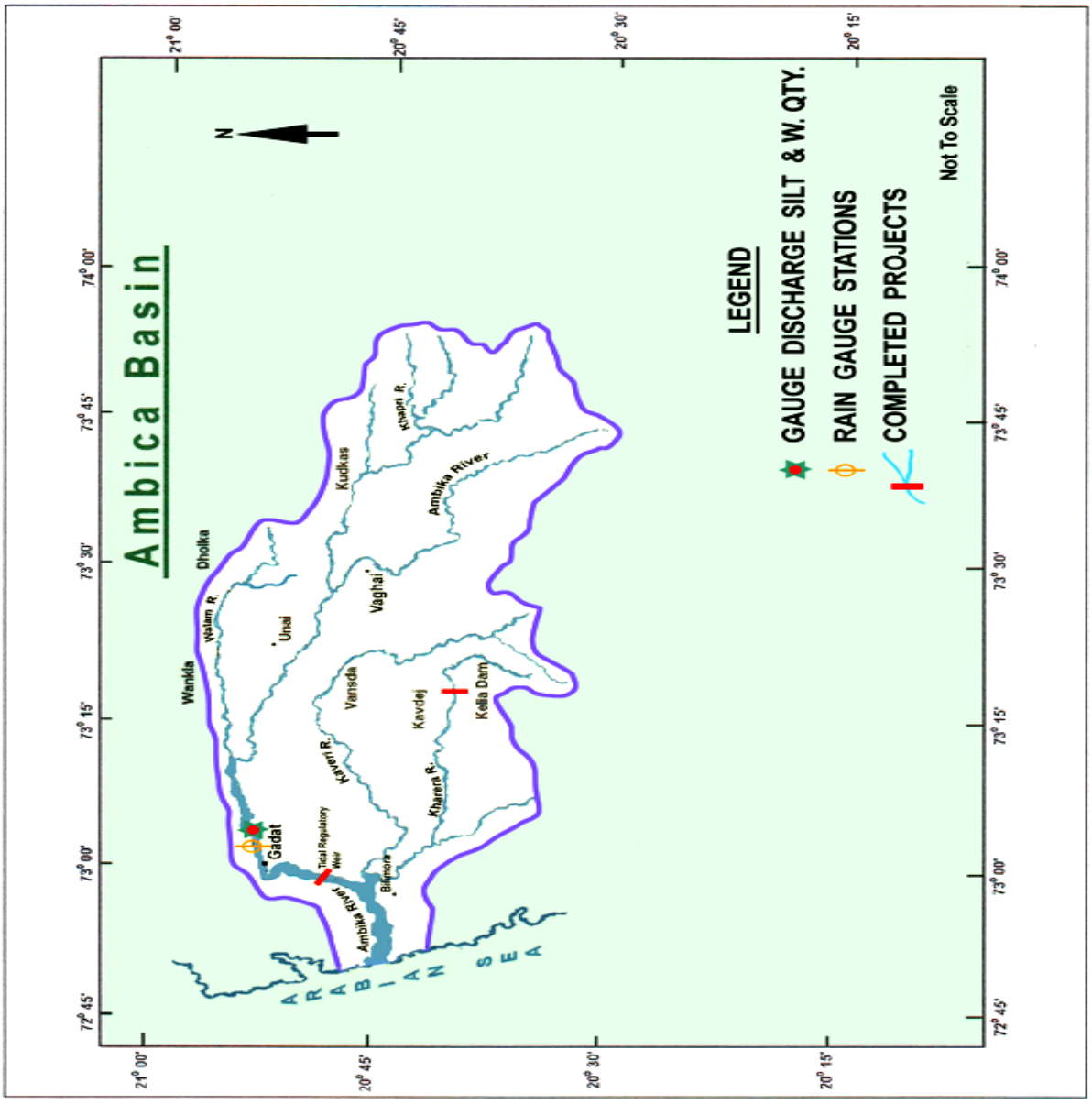
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

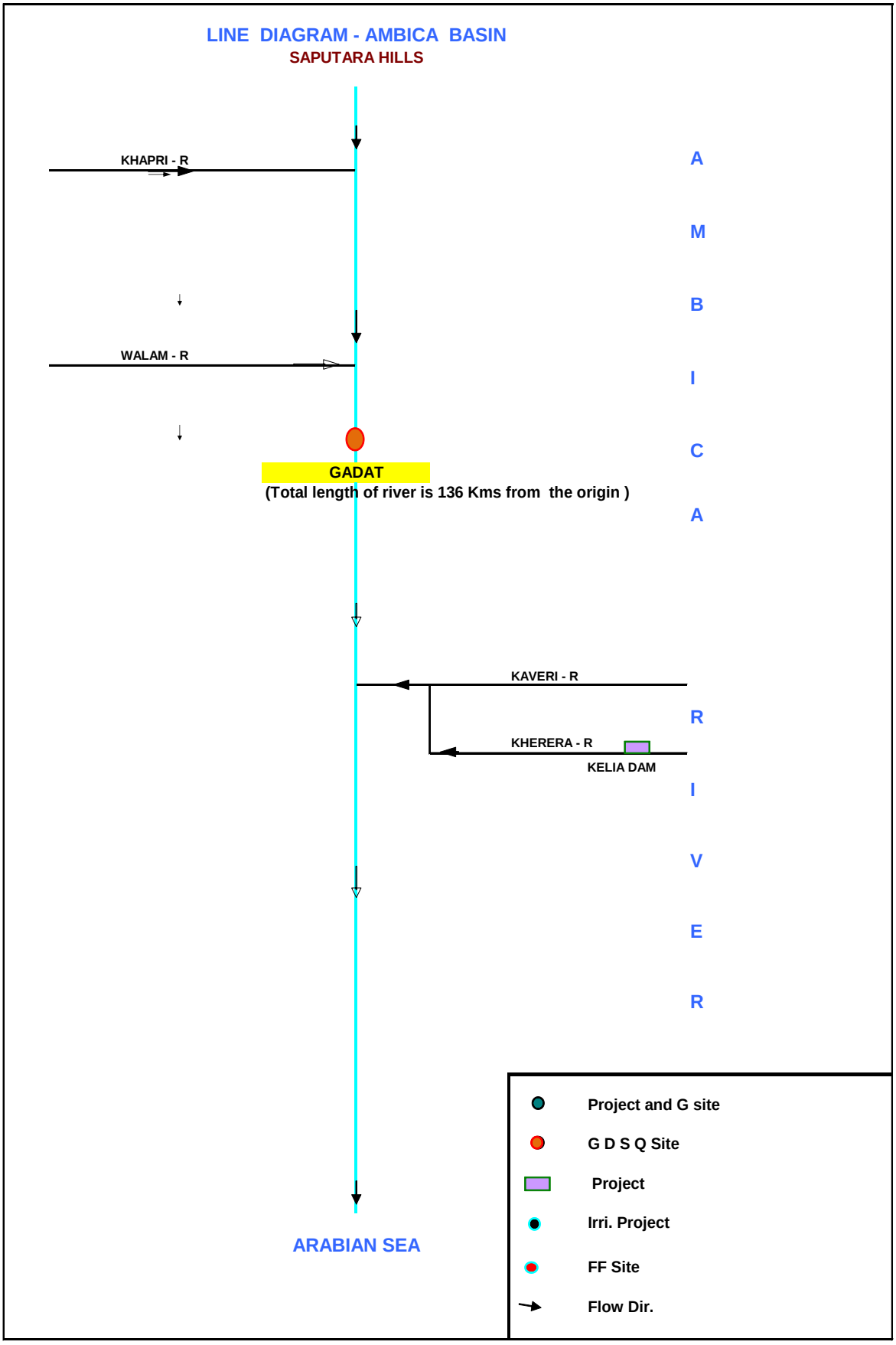
9. AMBIKA BASIN

9.0 Ambika Basin

9.1 Basin description

The river Ambika is one of the west flowing rivers in Gujarat State. Its basin map is enclosed. It originates from Satapura hill ranges and flows through Dangs and Valsad districts of Gujarat. After flowing for a length of 136 km, it falls into the Arabian Sea. The catchment area of Ambika basin is 2715 sq.km. The basin lies between $72^0$50' and 73^0 50' east longitudes and 20^0 03' and 21^0 08' north latitudes. The important tributaries of Ambika are Khapri and Walam.




LINE DIAGRAM - AMBICA BASIN
SAPUTARA HILLS
KHAPRI - R
WALAM - R
GADAT
(Total length of river is 136 Kms from the origin)
KAVERI - R
KHERERA - R
KELIA DAM
ARABIAN SEA
A
M
B
I
C
A
R
I
V
E
R
Project and G site
G D S Q Site
Project
Irri. Project
FF Site
Flow Dir.

9.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Ambika at Gadat**	**Code**	**:**	**01 02 20 001**
State	:	Gujarat	District		Valsad
Basin	:	WFR South of Tapi	Independent River	:	Ambika
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	
Division	:	Surat	Sub-Division	:	LTSD, Surat
Drainage Area	:	1510 Sq. Km.	Bank	:	Left Bank
Latitude	:	20°51'22" N	Longitude	:	72°59'05" E
		Opening Date	Closing Date		
Gauge	:	14/01/1979			
Discharge	:	12/03/1979			
Sediment	:	01/02/1985			
Water Quality	:	01/04/1980			

Water Quality Datasheet for the period : 2015-2016

Station Name: Ambika at Gadat (01 02 20 001) — **Division: Tapi Division, Surat**

Local River: Ambika — **River Water Analysis** — **Sub Division: LTSD, Surat**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	0.000	90.42	11.70	23.97	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear	Once in Two Months	Brown	Once in Two Months	Clear	Once in Two Months	Clear	Once in Two Months	Clear	Once in Two Months	Clear	Once in Two Months
3	EC_FLD (µmho/cm)												
4	EC_GEN (µmho/cm)	448		350		343		435		457		454	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	7.0		7.0				7.0		6.8		7.0	
7	pH_GEN (pH units)	8.3		8.2		8.2		8.0		8.0		8.2	
8	SS (mg/L)	145		75		100		140		130		145	
9	TDS (mg/L)	294		240		222		284		297		293	
10	Temp (deg C)	30.0		28.0		31.0		22.0		22.0		29.0	
11	TS (mg/L)			315		862				427		438	
12	Turb (NTU)	2.0		8.0		2.0		2.0		2.0		2.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0		0.0		0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)	105		123		85		90		100		105	
3	Ca (mg/L)	28		36		28		38		34		38	
4	Cl (mg/L)	60.0		70.0		60.0		78.0		65.0		60.0	
5	CO3 (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
6	F (mg/L)	0.15		0.10		0.15		0.13		0.14		0.13	
7	HCO3 (mg/L)	128		150		104		110		122		128	
8	K (mg/L)	3.6		3.4		4.4		4.4		5.0		3.4	
9	Mg (mg/L)	9.7		12.5		4.9		9.7		7.3		6.1	
10	Na (mg/L)	46.0		50.0		40.0		40.0		44.0		42.0	
11	NH3-N (mg N/L)	0.13		0.06		0.16		0.13		0.15		0.12	
12	NO2+NO3 (mg N/L)	0.20		0.20		0.23		0.20		0.16		0.25	
13	NO2-N (mgN/L)	0.06		0.10		0.10		0.08		0.06		0.12	
14	NO3-N (mgN/L)	0.14		0.10		0.13		0.12		0.10		0.13	
15	P-Tot (mgP/L)	0.130		0.120		0.140		0.150		0.160		0.140	
16	SiO2 (mg/L)	8.0		8.0		15.0		8.0		8.0		8.0	
17	SO4 (mg/L)	10.6		10.0		6.1		8.0		10.0		8.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	0.8		1.2		1.2		1.6		2.0		2.7	
2	COD (mg/L)	68.0		62.0		104.0		8.0		92.0		4.0	
3	DO (mg/L)	7.8		7.8		7.8		7.8		7.8		7.8	
4	DO_SAT% (%)	103		100		106		90		90		101	
5	FCol-MPN (MPN/100mL)	500		600		300		2000		500		1000	
6	Tcol-MPN (MPN/100mL)	900		900		800		3800		800		2000	
	TRACE & TOXIC												
1	Al (mg/L)	0.15		0.06		0.05		0.06		0.10		0.05	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	70		90		70		95		85		95	
2	HAR_Total (mgCaCO3/L)	111		142		90		136		116		121	
3	Na% (%)	47		43		48		38		44		42	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	1.9		1.8		1.8		1.5		1.8		1.7	
	PESTICIDES												

Water Quality Summary for the period 2015-2016

Station Name : Ambika at Gadat (01 02 20 001) **Division: Tapi Division, Surat**

Local River: Ambika **Sub-Division: LTSD, Surat**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	1227	0.000	14.37
2	EC_GEN (µmho/cm)	6	457	343	415
3	pH_FLD (pH units)	5	7.0	6.8	7
4	pH_GEN (pH units)	6	8.3	8.0	8.2
5	SS (mg/L)	6	145	75	123
6	TDS (mg/L)	6	297	222	272
7	Temp (deg C)	6	31.0	22.0	27
8	TS (mg/L)	4	862	315	511
9	Turb (NTU)	6	8.0	2.0	3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	123	85	101
3	Ca (mg/L)	6	38	28	34
4	Cl (mg/L)	6	78.0	60.0	65.5
5	CO3 (mg/L)	6	0.0	0.0	0
6	F (mg/L)	6	0.15	0.10	0.13
7	HCO3 (mg/L)	6	150	104	124
8	K (mg/L)	6	5.0	3.4	4
9	Mg (mg/L)	6	12.5	4.9	8.4
10	Na (mg/L)	6	50.0	40.0	43.7
11	NH3-N (mg N/L)	6	0.16	0.06	0.12
12	NO2+NO3 (mg N/L)	6	0.25	0.16	0.21
13	NO2-N (mgN/L)	6	0.12	0.06	0.09
14	NO3-N (mgN/L)	6	0.14	0.10	0.12
15	P-Tot (mgP/L)	6	0.160	0.120	0.14
16	SiO2 (mg/L)	6	15.0	8.0	9.2
17	SO4 (mg/L)	6	10.6	6.1	8.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	2.7	0.8	1.6
2	COD (mg/L)	6	104.0	4.0	56.3
3	DO (mg/L)	6	7.8	7.8	7.8
4	DO_SAT% (%)	6	106	90	98
5	FCol-MPN (MPN/100mL)	6	2000	300	817
6	Tcol-MPN (MPN/100mL)	6	3800	800	1533
	TRACE & TOXIC				
1	Al (mg/L)	6	0.15	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	95	70	84
2	HAR_Total (mgCaCO3/L)	6	142	90	119
3	Na% (%)	6	48	38	44
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	1.9	1.5	1.8
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2016

Station Name : Ambika at Gadat (01 02 20 001) — **Division: Tapi Division, Surat**

Local River: Ambika — **Sub-Division: LTSD, Surat**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																		
1	Q (cumec)	609.4	117.8	476.1	82.01	43.46	142.0	184.7	87.80	136.2	253.6	25.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.000
2	EC_FLD (µmho/cm)			486	455	440	386	435	480	490					493	524	455	470								437	464	475							
3	EC_GEN (µmho/cm)	271	286	378	381	397	356	370	345	368	306	380	405	483	556	495	417	355			502	305	446	423	530	486	442	410		541		510	486	454
4	pH_FLD (pH units)			8.0	7.8	7.8	7.9	7.7			7.0	7.0			8.0	7.9	7.9	7.9				7.0	6.9			7.8	7.8	7.0				7.0	7.0	7.0
5	pH_GEN (pH units)	8.2	8.3	8.2	7.6	8.0	8.0	7.4	7.5	7.9	8.2	8.2	8.2	8.3	7.9	7.3	7.7	8.2			8.1	8.0	8.0	8.4	8.8	8.4	8.4	7.9		6.5		8.3	8.4	8.2
6	SS (mg/L)	64	91	138	120	155	120	123	110	112	102	107	90	119	192	165	169	122			160	128	135	78	104	166	183	139		180		160	140	145
7	TDS (mg/L)	191	198	271	256	261	240	215	220	242	199	252	285	333	326	306	273	244			326	206	291	276	403	317	310	272		350		300	300	293
8	Temp (deg C)	28.3	24.0	27.3	26.3	26.3	26.3	24.5	25.5	24.3	30.0	29.7	20.5	22.5	22.0	23.5	24.0	26.0			22.5	23.5	22.0	24.0	27.0	27.0	23.0	24.0		25.0		28.0	27.0	29.0
9	TS (mg/L)						360	359	330	302	301	589						366			486	334	427							530		485	454	438
1	Turb (NTU)						2.3	7.0	11.5	1.3	4.0	4.0						1.0			2.5	2.0	2.0							3.0		2.0	2.0	2.0
	CHEMICAL																																		
1	Alk-Phen	2.0	3.3	3.3	1.7	1.7	5.5	0.0	0.0	0.0	10.8	0.0	0.0	2.5	2.5	0.0	0.0	0.0			0.0	5.0	0.0	5.0	5.0	5.0	5.0	0.0		0.0		5.0	14.1	0.0
2	ALK-TOT (mgCaCO3/L)	147	193	213	177	210	104	82	105	65	118	104	320	185	175	190	90	80			98	99	95	470	210	190	310	120		90		113	215	105
3	Ca (mg/L)	32	32	32	32	33	32	32	32	29	35	31	32	34	32	32	32	36			31	35	36	34	32	32	32	34		36		38	43	38
4	Cl (mg/L)	24.2	12.9	55.9	29.8	187.0	85.5	84.1	49.8	83.3	67.7	63.3	25.8	19.5	38.5	44.9	76.6	145.0			95.0	62.5	71.5	31.3	13.5	23.1	189.4	127.7		222.0		72.0	62.0	60.0
5	CO3 (mg/L)	1.3	4.0	4.0	2.0	2.0	6.7	0.0	0.0	0.0	13.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0			0.0	6.0	0.0	6.0	6.0	6.0	6.0	0.0		0.0		6.0	17.0	0.0
6	F (mg/L)	0.09	0.05	0.14	0.06	0.15	0.17	0.05	0.23	0.13	0.14	0.13	0.05	0.05	0.07	0.16	0.18	0.18			0.16	0.21	0.13	0.05	0.05	0.07	0.32	0.24		0.16		0.24	0.14	0.13
7	HCO3 (mg/L)	179	114	126	106	126	114	101	128	80	117	127	262	110	104	116	110	98			119	109	116	280	122	110	183	146		110		126	228	128
8	K (mg/L)		0.4	12.1	0.3	7.2	13.3	9.6	2.4	3.2	3.6	3.8		0.7	2.9	1.9	2.0	4.2			4.4	3.8	4.7		4.4	0.3	26.2	11.4		10.2		4.4	4.2	3.4
9	Mg (mg/L)	8.4	7.4	7.8	7.1	8.7	8.2	7.1	8.0	7.0	8.9	9.0	8.3	9.2	6.8	8.8	8.7	8.3			8.1	8.8	8.5	9.7	8.7	5.8	7.8	9.7		8.6		8.8	15.5	6.1
1	Na (mg/L)		7.8	33.4	17.3	125.2	49.3	45.7	37.1	47.1	50.5	45.3		11.5	22.9	29.3	44.4	77.4			64.5	40.4	42.0		7.8	14.9	138.6	84.6		130.0		54.0	46.0	42.0
1	NH3-N (mg N/L)	0.06	0.11	0.08	0.06	0.07	0.06	0.07	0.10	0.11	0.14	0.12	0.05	0.06	0.08	0.07	0.05	0.06			0.13	0.12	0.14	0.05	0.05	0.07	0.16	0.05		0.12		0.16	0.13	0.12
1	NO2+NO3 (mg N/L)	0.19	0.02	0.04	0.03	0.05	0.20	0.13	0.20	0.18	0.18	0.21	0.01	0.01	0.05	0.06	0.03	0.16			0.26	0.24	0.18	0.01	0.01	0.04	0.04	0.06		0.11			0.22	0.25
1	NO2-N (mgN/L)	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.04	0.05	0.06	0.09	0.00	0.00	0.00	0.00	0.00	0.06			0.12	0.07	0.07	0.00	0.00	0.00	0.00	0.00		0.01			0.06	0.12
1	NO3-N (mgN/L)	0.19	0.02	0.04	0.03	0.05	0.17	0.10	0.17	0.14	0.12	0.12	0.01	0.01	0.05	0.06	0.03	0.10			0.15	0.17	0.11	0.01	0.01	0.04	0.04	0.06		0.10		0.12	0.16	0.13
1	o-PO4-P (mg P/L)						0.073	0.080	0.065									0.060												0.100				
1	P-Tot (mgP/L)	0.304	0.107	0.127	0.265	0.200	0.120	0.360	0.140	0.173	0.160	0.131	0.111	0.060	0.183	0.170	0.060	0.140			0.180	0.150	0.151	0.080	0.060	0.063	0.280	0.240		0.240		0.200	0.160	0.140
1	SiO2 (mg/L)	21.8	22.3	21.1	26.6	20.2	20.1	18.1	9.0	6.6	7.8	10.3	14.8	14.8	21.6	17.8	14.5	20.6			8.4	7.7	8.0	15.1	15.1	24.3	17.7	12.7		8.0		8.2	8.0	8.0
1	SO4 (mg/L)	24.1	10.1	6.2	7.4	17.3	7.1	8.0	11.6	12.3	8.4	8.9	16.6	16.3	6.3	16.6	12.2	4.8			11.3	12.3	9.0	13.8	3.0	1.0	13.3	14.4		12.0		18.0	4.0	8.0
	BIOLOGICAL/BACTERI																																		
1	BOD3-27 (mg/L)	0.5	0.4	0.7	0.3	0.7	0.8	0.9	0.6	2.1	2.0	1.1	0.4	0.7	0.5	0.7	0.5	0.5			1.8	1.4	1.8	0.6	1.4	0.7	0.6	2.5		0.7		3.4	4.7	2.7
2	COD (mg/L)											78.0										12.0	50.0										64.0	4.0
3	DO (mg/L)									7.8	8.7	7.8					6.8					7.8	7.8					10.4					7.8	7.8
4	DO_SAT% (%)									98	115	103					81					92	90					124					98	101
5	FCol-MPN										2100	467									650	750	1250								8000	500	1000
6	Tcol-MPN										4600	867									1400	1400	2300								1600	800	2000
	TRACE & TOXIC																																		
1	Al (mg/L)						0.15	0.06	0.09	0.11	0.08	0.09						0.06			0.11	0.10	0.08							0.10		0.06	0.08	0.05
	CHEMICAL INDICES																																		
1	HAR_Ca (mgCaCO3/L)	80	79	80	80	81	80	80	80	73	87	77	80	84	80	80	80	90			78	88	90	84	80	80	80	84		90		95	108	95
2	HAR_Total	115	110	113	110	118	114	110	113	102	124	114	115	123	108	117	116	125			111	124	126	125	116	104	113	125		126		132	172	121
3	Na% (%)		13	36	25	54	40	45	41	47	46	46		15	28	35	45	57			55	41	41		12	24	67	57		67		46	36	42
4	RSC (-)	1.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	2.3	0.0	0.0	1.0	0.0		0.0		0.0	0.9	0.0
5	SAR (-)		0.3	1.4	0.7	5.0	2.0	1.9	1.5	2.0	2.0	1.9		0.5	1.0	1.2	1.8	3.0			2.7	1.6	1.6		0.3	0.6	5.7	3.3		5.1		2.1	1.5	1.7
	PESTICIDES																																		

ONCE IN 2 MONTHS / POOLING CONDITION

ONCE IN 2 MONTHS / POOLING CONDITION

ONCE IN 2 MONTHS / POOLING CONDITION

ONCE IN 2 MONTHS / POOLING CONDITION

Pesticides, Trace and Toxic element analysis

Station Name: Ambika at Gadat (01 02 20 001) **Division: Tapi Division, surat**

Local River: Ambika **Sub Division: LTSD, Surat**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	0.5259	POOLING CONDITION	1.10	POOLING CONDITION	0.6201	0.67	10.27	POOLING CONDITION	POOLING CONDITION	9.1	0.765	POOLING CONDITION	-	-	0.573	0.00129	0.00432	0.5614
2	Cd	Cadmium	microgram / l	-	-	0.74	2.11	0.0108		0.008		0.0400	0.04	0.21			0.256	0.0000		0.180	0.008	1.00	0.00009	0.0001	0
3	Cr	Chromium	microgram / l	-	-	0	0	0		1.92		0	6.97	4.62			8.24	0		10.150	0.009	0.00	0.01673	0.00058	0
4	Cu	Copper	microgram / l	-	-	-	-	-		7.87		-	2.89	12.82			20.47	-		1.620	0.041	-	0.00063	0.00208	
5	Hg	Mercury	microgram / l	-	-	0	-	-		0.52		0.147	-	-			0.69	0.119		-	-	0.21			0
6	Ni	Nickel	microgram / l	-	-	8.11	0.00	2.290		-		0.070	5.48	8.83			8.11	0		0.780	0.002	3.63	0.00077	0.00293	0
7	Pb	Lead	microgram / l	-	-	12.27	29.03	0.00		0.52		20.22	4.64	2.46			1.08	48.60		0.610	0.003	18.00	0.00015	0.00046	0
8	Zn	Zinc	microgram / l	-	-	3.99	21.29	15.43		5.78		14.21	34.00	32.9			0.01	28.50		0.009	0.013	0.00	0.00255	0.0075	9.84
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0	0.0013	0.0038		-		0.0039	-	-			-	-		-		-			
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	0.01	0.0066	0.0132		-		0.2896	-	-			-	-		-		-			
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	-	-		-		-	-	-			-	-		-		-			
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-	-	-		-		-	-	-			-	-		-		-			
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-		-		-	-	-			-	-		-		-			
6	DDT	DDT	microgram / l	-	-	0.01	0.0008	0.0043		-		0.0037	-	-			-	-		-		-			
7	Dieldrin	Dieldrin	microgram / l	-	-	0	0.0006	0.0110		-		0.0042	-	-			-	-		-		-			
8	Endos-I	Endosulphan I	microgram / l	-	-	0.02	0.00	0.01		-		0.09	-	-			-	-		-		-			
9	Endos-II	Endosulphan II	microgram / l	-	-	-	-	-		-		-	-	-			-	-		-		-			
10	Endos-s	Endosulphan s	microgram / l	-	-	-	-	-		-		-	-	-			-	-		-		-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

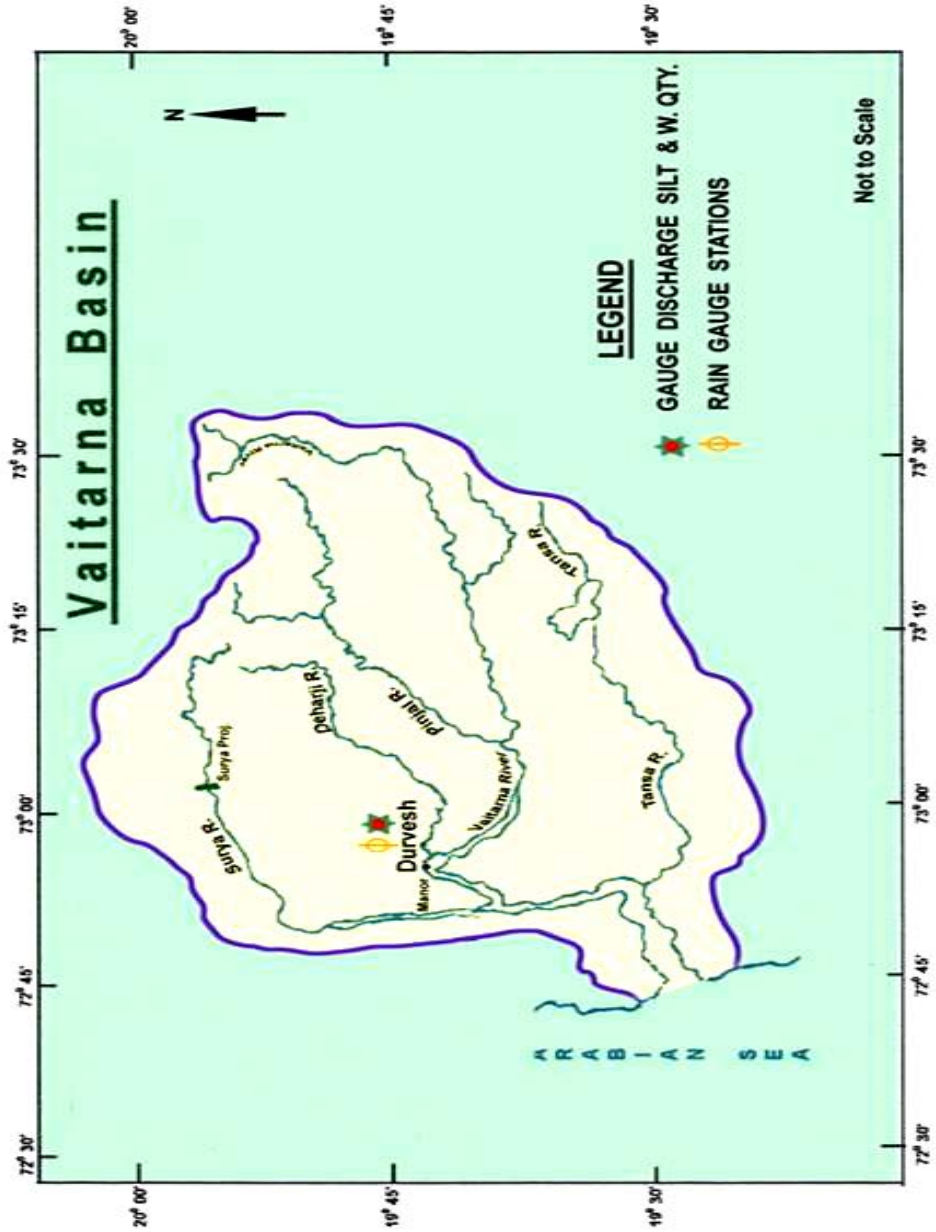
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

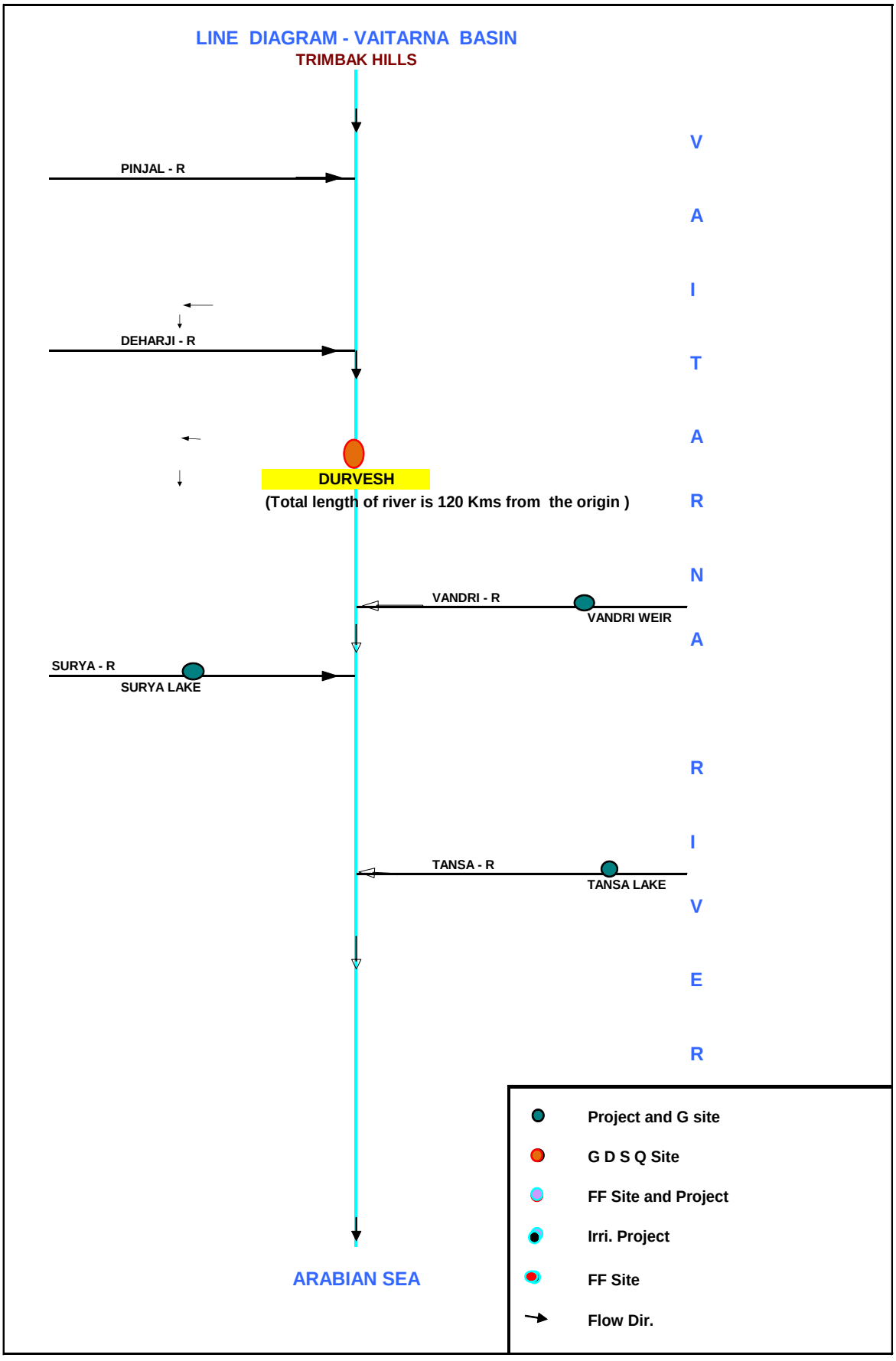
10. VAITARNA BASIN

10.0 Vaitarna Basin

10.1 Basin description

The river Vaitarna originates from hilly terrain of Maharashtra at Trimbak in Nasik district. Its basin map is enclosed. After running for 120 km in Maharashtra towards west, it falls into the Arabian Sea. The catchment area of the basin is 3,637 sq.km. This drainage area is located between east longitudes of 72° 45’ and 73° 35’ and north latitudes of 19° 30’ and 20° 20’. The main tributaries of this river are Pinjal, Garjal, Surya, Daharji and Tansa. There are some irrigation projects under construction namely Surya and Wandri on the tributaries of the Vaitarna river.




LINE DIAGRAM - VAITARNA BASIN
TRIMBAK HILLS
PINJAL - R
DEHARJI - R
DURVESH
(Total length of river is 120 Kms from the origin)
VANDRI - R
VANDRI WEIR
SURYA - R
SURYA LAKE
TANSA - R
TANSA LAKE
ARABIAN SEA
V A I T A R N A R I V E R
Project and G site
G D S Q Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

10.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Vaitarna at Durvesh**	**Code**	**:**	**01 02 25 001**
State	:	Maharashtra	District		Thane
Basin	:	WFR South of Tapi	Independent River	:	Vaitarna
Tributary	:		Sub Tributary	:	
Sub-Sub Tributary	:		Local River	:	
Division	:	Tapi Division, Surat	Sub-Division	:	DGSD,CWC,Silvassa
Drainage Area	:	2019 Sq. Km.	Bank	:	Left
Latitude	:	19°42'45" N	Longitude	:	72°55'50" E
		Opening Date	Closing Date		
Gauge	:	26/10/1970			
Discharge	:	26/01/1971			
Sediment	:	26/01/1971			
Water Quality	:	01/06/1977			

Water Quality Datasheet for the period : 2015-2016

Station Name: Vaitarna at Durvesh (01 02 25 001) — **Division: Tapi Division, Surat**

Local River: Vaitarna — **Sub Division: DGSD, Silvassa**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	0.000	41.74	189.7	46.64	14.77	1.742	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear	Once in Two Months	Light Brown	Once in Two Months	Brown	Once in Two Months	Clear	Once in Two Months	Clear	Once in Two Months	Clear	Once in Two Months
3	EC_FLD (µmho/cm)												
4	EC_GEN (µmho/cm)	353		187		290		460		570		560	
5	Odour_Code (-)	odour free		odour free		odour free		1		odour free		odour free	
6	pH_FLD (pH units)	8.0		8.2		8.1		6.0		6.5		6.8	
7	pH_GEN (pH units)	7.9		7.9		8.1		8.0		8.2		8.2	
8	SS (mg/L)	114		65		100		180		190		200	
9	TDS (mg/L)	228		120		190		300		370		360	
10	Temp (deg C)	22.0		18.0		19.0		17.0		17.0		21.0	
11	TS (mg/L)			185						3320		1755	
12	Turb (NTU)	2.0		10.0				1.0		2.0		3.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0		0.0		0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)	115		125		100		100		120		95	
3	Ca (mg/L)	34		40		20		36		40		34	
4	Cl (mg/L)	72.0		80.0		50.0		78.0		78.0		70.0	
5	CO3 (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
6	F (mg/L)	0.14				0.13				0.16		0.13	
7	HCO3 (mg/L)	140		153		122		122		146		116	
8	K (mg/L)	3.0		3.8		3.0		4.2		3.8		3.0	
9	Mg (mg/L)	6.1		14.6		10.9		12.2		7.3		6.1	
10	Na (mg/L)	56.0		46.0		38.0		42.0		50.0		52.0	
11	NH3-N (mg N/L)	0.12		0.10		0.12		0.13		0.12		0.08	
12	NO2+NO3 (mg N/L)	0.21		0.22		0.28		0.18		0.17		0.20	
13	NO2-N (mgN/L)	0.08		0.10		0.12		0.06		0.05		0.08	
14	NO3-N (mgN/L)	0.13		0.12		0.16		0.12		0.12		0.12	
15	P-Tot (mgP/L)	0.160		0.100		0.130		0.140		0.120		0.140	
16	SiO2 (mg/L)	10.0		10.0		12.0				10.0		8.0	
17	SO4 (mg/L)	13.0		6.0		5.0		8.0		9.0		15.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	1.5		0.7		1.6				2.8		2.5	
2	COD (mg/L)	32.0		42.0		64.0				12.0		16.0	
3	DO (mg/L)	7.3		8.3		5.7		6.2		6.5		6.9	
4	DO_SAT% (%)	83		88		62		64		67		78	
5	FCol-MPN (MPN/100mL)	400		400		500		700		1600		900	
6	Tcol-MPN (MPN/100mL)	600		700		1200		1600		3000		2000	
	TRACE & TOXIC												
1	Al (mg/L)	0.08		0.12		0.06		0.08		0.09		0.08	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	85		100		50		90		100		85	
2	HAR_Total (mgCaCO3/L)	111		161		96		141		131		111	
3	Na% (%)	52		38		46		39		45		50	
4	RSC (-)	0.1		0.0		0.1		0.0		0.0		0.0	
5	SAR (-)	2.3		1.6		1.7		1.5		1.9		2.2	
	PESTICIDES												

Water Quality Summary for the period 2015-2016

Station Name : Vaitarna at Durvesh (01 02 25 001) **Division: Tapi Division, Surat**

Local River: Vaitarna **Sub-Division: DGSD, Silvassa**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	1475	0.000	34.44
2	EC_GEN (µmho/cm)	6	570	187	403
3	pH_FLD (pH units)	6	8.2	6.0	7.3
4	pH_GEN (pH units)	6	8.2	7.9	8.1
5	SS (mg/L)	6	200	65	142
6	TDS (mg/L)	6	370	120	261
7	Temp (deg C)	6	22.0	17.0	19
8	TS (mg/L)	3	3320	185	1753
9	Turb (NTU)	5	10.0	1.0	3.6
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	125	95	109
3	Ca (mg/L)	6	40	20	34
4	Cl (mg/L)	6	80.0	50.0	71.3
5	CO3 (mg/L)	6	0.0	0.0	0
6	F (mg/L)	6	0.16	0.13	0.14
7	HCO3 (mg/L)	6	153	116	133
8	K (mg/L)	6	4.2	3.0	3.5
9	Mg (mg/L)	6	14.6	6.1	9.5
10	Na (mg/L)	6	56.0	38.0	47.3
11	NH3-N (mg N/L)	6	0.13	0.08	0.11
12	NO2+NO3 (mg N/L)	6	0.28	0.17	0.21
13	NO2-N (mgN/L)	6	0.12	0.05	0.08
14	NO3-N (mgN/L)	6	0.16	0.12	0.13
15	P-Tot (mgP/L)	6	0.160	0.100	0.132
16	SiO2 (mg/L)	5	12.0	8.0	10
17	SO4 (mg/L)	6	15.0	5.0	9.3
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	2.8	0.7	1.8
2	COD (mg/L)	5	64.0	12.0	33.2
3	DO (mg/L)	6	8.3	5.7	6.8
4	DO_SAT% (%)	6	88	62	74
5	FCol-MPN (MPN/100mL)	6	1600	400	750
6	Tcol-MPN (MPN/100mL)	6	3000	600	1517
	TRACE & TOXIC				
1	Al (mg/L)	6	0.12	0.06	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	100	50	85
2	HAR_Total (mgCaCO3/L)	6	161	96	125
3	Na% (%)	6	52	38	45
4	RSC (-)	6	0.1	0.0	0
5	SAR (-)	6	2.3	1.5	1.9
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2015

Station Name : Vaitarna at Durvesh (01 02 25 001) **Division: Tapi Division, Surat**

Local River: Vaitarna **Sub-Division: DGSD, Silvassa**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	480.	401.	468.	401.	73.7	542.	460.	256.	279.	651.	58.5	7.05	6.02	7.71	12.0	15.2	34.1	10.4	1.75	22.2	0.47	0.43	0.00	0.00	1.42	3.14	0.00	0.00	0.00	0.00	0.00	0.00	0.000
2	EC_FLD (µmho/cm)			128	510	137	265				390			143	165	949	177				625							1585				1200		
3	EC_GEN (µmho/cm)	666	92	178	182	285	254	297	269	219	346	277	1511	288	763	5166	4433			290	809	380	515	1000	2396	7269	1000	1976			290	900	760	560
4	pH_FLD (pH units)			8.0	8.0	8.1	7.3				8.5	8.1		7.4	7.5	7.6	8.1				8.4	8.7	6.3					7.0				8.2	8.8	6.8
5	pH_GEN (pH units)	7.9	8.0	8.0	8.1	7.9	7.5	7.5	7.7	8.2	8.1	8.0	7.7	8.2	8.5	8.0	7.9			7.8	8.0	8.3	8.1	8.0	8.4	8.4	7.6	7.9			7.8	8.4	8.2	8.2
6	SS (mg/L)	52	49	94	79	112	100	98	85	85	105	93	121	83	168	748	1260			82	270	115	185	989	292	622	1607	572			100	280	250	200
7	TDS (mg/L)	117	70	124	121	185	201	230	177	141	224	179	1196	194	458	3570	2502			190	534	247	335	8954	2107	4750	6970	1153			230	589	505	360
8	Temp (deg C)	27.0	27.0	18.6	29.0	29.0	28.5	28.5	27.0	24.5	22.3	19.7	24.0	25.0	24.0	24.0	24.5			13.0	18.5	16.5	17.0	27.0	27.0	28.0	25.0	26.0			22.0	20.0	20.0	21.0
9	TS (mg/L)						301	295	262	297	329	185								272	804	347	3320								330	869	755	1755
1	Turb (NTU)						2.5	11.0	5.0	3.0	1.7	6.0								1.0	2.0	2.0	1.5								1.0	1.0	4.0	3.0
	CHEMICAL																																	
1	Alk-Phen	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	1.1	0.0	0.0	0.0	5.0	0.0	0.0			0.0	0.0	7.9	0.0	0.0	5.0	5.0	0.0	0.0			0.0	5.0	8.3	0.0
2	ALK-TOT (mgCaCO3/L)	85	170	200	170	185	117	78	95	91	94	113	130	200	170	260	100			80	104	93	110	240	290	170	800	130			90	95	204	95
3	Ca (mg/L)	31	31	31	30	32	31	31	31	34	34	31	31	32	32	39	33			28	34	29	38	39	32	35	40	36			30	40	40	34
4	Cl (mg/L)	6.9	5.1	63.0	13.8	34.6	59.8	110.	34.3	91.5	74.3	67.3	406.	1.0	73.7	1194	4655			75.2	83.0	75.0	78.0	5013	59.1	117.	4731	355.			78.0	146.	80.0	70.0
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	1.3	0.0	0.0	0.0	6.0	0.0	0.0			0.0	0.0	9.5	0.0	0.0	6.0	6.0	0.0	0.0			0.0	6.0	10.0	0.0
6	F (mg/L)	0.05	0.05	0.05	0.07	0.13	0.11	0.06	0.18	0.20	0.17	0.13	0.22	0.05	0.05	0.36	0.09			0.30	0.20	0.25	0.16	0.05	0.09	0.05	0.44	0.28			0.16	0.20	0.15	0.13
7	HCO3 (mg/L)	104	104	122	104	110	143	95	116	106	112	138	159	122	98	159	122			98	127	95	134	146	171	98	488	159			110	104	228	116
8	K (mg/L)		0.1	14.9	0.1	3.1	17.6	9.9	2.1	3.1	3.5	3.3		1.1	5.5	30.6	83.5			2.4	5.2	4.0	4.0		11.1	12.1	440.	12.4			2.6	5.8	4.8	3.0
9	Mg (mg/L)	6.3	5.8	7.4	6.3	6.9	9.3	6.4	6.8	7.2	6.5	10.5	5.8	7.8	8.7	12.6	9.2			6.6	8.8	11.5	9.7	12.6	7.9	11.7	11.7	12.6			6.0	9.7	13.6	6.1
1	Na (mg/L)		3.1	36.5	7.7	25.7	44.0	60.8	23.0	55.1	49.8	46.7		1.0	39.5	776.	2990			53.8	54.0	46.4	46.0		34.3	76.5	3078	232.			53.8	86.0	52.4	52.0
1	NH3-N (mg N/L)	0.05	0.08	0.05	0.07	0.07	0.07	0.09	0.11	0.16	0.15	0.11	0.20	0.05	0.05	0.26	0.10			0.12	0.17	0.16	0.12	0.18	0.08	0.13	0.08	0.08			0.12	0.20	0.12	0.08
1	NO2+NO3 (mg N/L)	0.01	0.01	0.02	0.04	0.04	0.28	0.13	0.14	0.22	0.21	0.24	0.08	0.00	0.01	0.17	0.03			0.16	0.20	0.21	0.17	0.01	0.03	0.07	0.13	0.07			0.20		0.19	0.20
1	NO2-N (mgN/L)	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.04	0.08	0.08	0.10	0.00	0.00	0.00	0.00	0.00			0.05	0.06	0.07	0.05	0.00	0.00	0.00	0.00	0.00			0.08		0.06	0.08
1	NO3-N (mgN/L)	0.01	0.01	0.02	0.04	0.04	0.20	0.11	0.10	0.14	0.13	0.14	0.08	0.00	0.01	0.17	0.03			0.11	0.13	0.14	0.12	0.01	0.03	0.07	0.13	0.07			0.12	0.16	0.13	0.12
1	o-PO4-P (mg P/L)						0.07	0.08	0.05											0.16														
1	P-Tot (mgP/L)	0.25	0.07	0.06	0.40	0.13	0.06	0.40	0.21	0.22	0.15	0.13	0.18	0.05	0.09	0.38	0.12			0.38	0.21	0.21	0.13	0.02	0.08	0.06	0.32	0.20			0.25	0.22	0.18	0.140
1	SiO2 (mg/L)	18.6	19.9	20.4	23.6	20.5	12.1	16.0	9.0	6.4	6.6	10.7	14.8	15.3	22.4	26.8	14.9			10.0	9.2	8.5	10.0	22.2	20.8	28.8	28.5	13.5			12.0	8.0	9.6	8.0
1	SO4 (mg/L)	11.7	7.9	4.4	9.0	13.4	3.7	9.1	6.8	11.0	12.3	8.0	37.5	8.4	5.6	28.8	46.0			10.6	15.8	15.2	8.5	144.	25.6	55.9	284.	18.3			10.2	16.0	4.0	15.0
	BIOLOGICAL/BACTERI																																	
1	BOD3-27 (mg/L)	0.2	0.5	0.9	0.7	0.7	0.6	1.8	0.6	1.5	1.3	1.3	2.0	1.3	0.4	9.0	1.1			1.4	1.8	2.4	2.8	4.0	5.0	8.0	5.0	8.0			2.0	3.3	4.5	2.5
2	COD (mg/L)											46.0										36.0	12.0										64.0	16.0
3	DO (mg/L)			5.6	5.8	5.8	9.0			6.6	5.9	7.1		6.3	5.9	5.8	7.1				9.3	6.2	6.3					5.5				11.2	5.5	6.9
4	DO_SAT% (%)			73	75	74	119			81	67	78		76	70	69	88				98	63	66					68				123	60	78
5	FCol-MPN										1133	433									1000	1000	1150									3000	400	900
6	Tcol-MPN										2400	833									3000	1700	2300									7000	800	2000
	TRACE & TOXIC																																	
1	Al (mg/L)						0.10	0.08	0.14	0.14	0.15	0.09								0.14	0.10	0.10	0.09								0.10	0.08	0.06	0.08
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	76	76	78	76	80	78	78	78	85	85	78	76	80	80	97	82			70	85	72	95	97	80	88	100	89			75	100	100	85
2	HAR_Total	103	100	109	102	109	117	104	106	115	112	122	100	113	116	150	121			98	121	120	136	150	113	137	149	142			100	141	157	111
3	Na% (%)		6	38	14	32	30	52	31	50	48	45		2	41	90	64			54	47	45	42		37	52	90	76			53	56	41	50
4	RSC (-)	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.7	0.0	5.0	0.0			0.0	0.0	1.0	0.0
5	SAR (-)		0.1	1.5	0.3	1.1	1.7	2.6	1.0	2.2	2.1	1.9		0.0	1.6	27.7	110.			2.4	2.1	1.8	1.7		1.4	2.9	110.	8.5			2.3	3.2	1.8	2.2
	PESTICIDES																																	

ONCE IN 2 MONTHS / POOLING CONDITION

Pesticides, Trace and Toxic element analysis

Station Name: Vaitarna at Durvesh (01 02 25 001) **Division: Tapi Division, surat**

Local River: Vaitarna **Sub Division: DGSD, Silvassa**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	0.1316	POOLING CONDITION	1.07	POOLING CONDITION	POOLING CONDITION	1.09	11.3	POOLING CONDITION	POOLING CONDITION	9.1	1.07	POOLING CONDITION	-	-	0.128	0.00173	0.00742	0
2	Cd	Cadmium	microgram / l	-	-	8.86	35.86	0.1684		0.011			0.23	0.30			0.26	0.011		0.450	0.006	2.000	0.00013	0.0004	12.5
3	Cr	Chromium	microgram / l	-	-	0	11.68	0		3.57			8.23	6.01			8.24	3.57		6.29	0.003	0.000	0.02465	0.00069	0
4	Cu	Copper	microgram / l	-	-	-	-	-		7.24			37.36	9.00			20.47	7.24		8.1	0.024	-	0.00038	0.0015	
5	Hg	Mercury	microgram / l	-	-	0	-	-		0.53			-	-			0.69	0.53		-	-	0.143			0
6	Ni	Nickel	microgram / l	-	-	66.59	183.84	0.653		-			4.90	11.77			8.11	-		0.73	0.116	8.080	0.00249	0.00051	123.8
7	Pb	Lead	microgram / l	-	-	96.44	305.26	0.000		1.30			4.46	3.89			1.08	1.30		0.80	0.179	18.00	0.00061	0.00197	67
8	Zn	Zinc	microgram / l	-	-	16.66	30.35	8.663		43.93			33.00	26.93			0.01	43.93		0.03	0.006	0.000	0.00249	0.02	7.17
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0	0	0		-			-	-			-	0							
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	0.01	0	0		-			-	-			-	0							
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	-	-		-			-	-			-	-							
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-	-	-		-			-	-			-	-							
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-		-			-	-			-	-		-	-	-			
6	DDT	DDT	microgram / l	-	-	0	0	0.0032		-			-	-			-	-		-	-	-			
7	Dieldrin	Dieldrin	microgram / l	-	-	0	0	0.0027		-			-	-			-	-		-	-	-			
8	Endos-I	Endosulphan I	microgram / l	-	-	0	0.0025	0.0926		-			-	-			-	-		-	-	-			
9	Endos-II	Endosulphan II	microgram / l	-	-	-	-	-		-			-	-			-	-		-	-	-			
10	Endos-s	Endosulphan s	microgram / l	-	-	-	-	-		-			-	-			-	-		-	-	-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

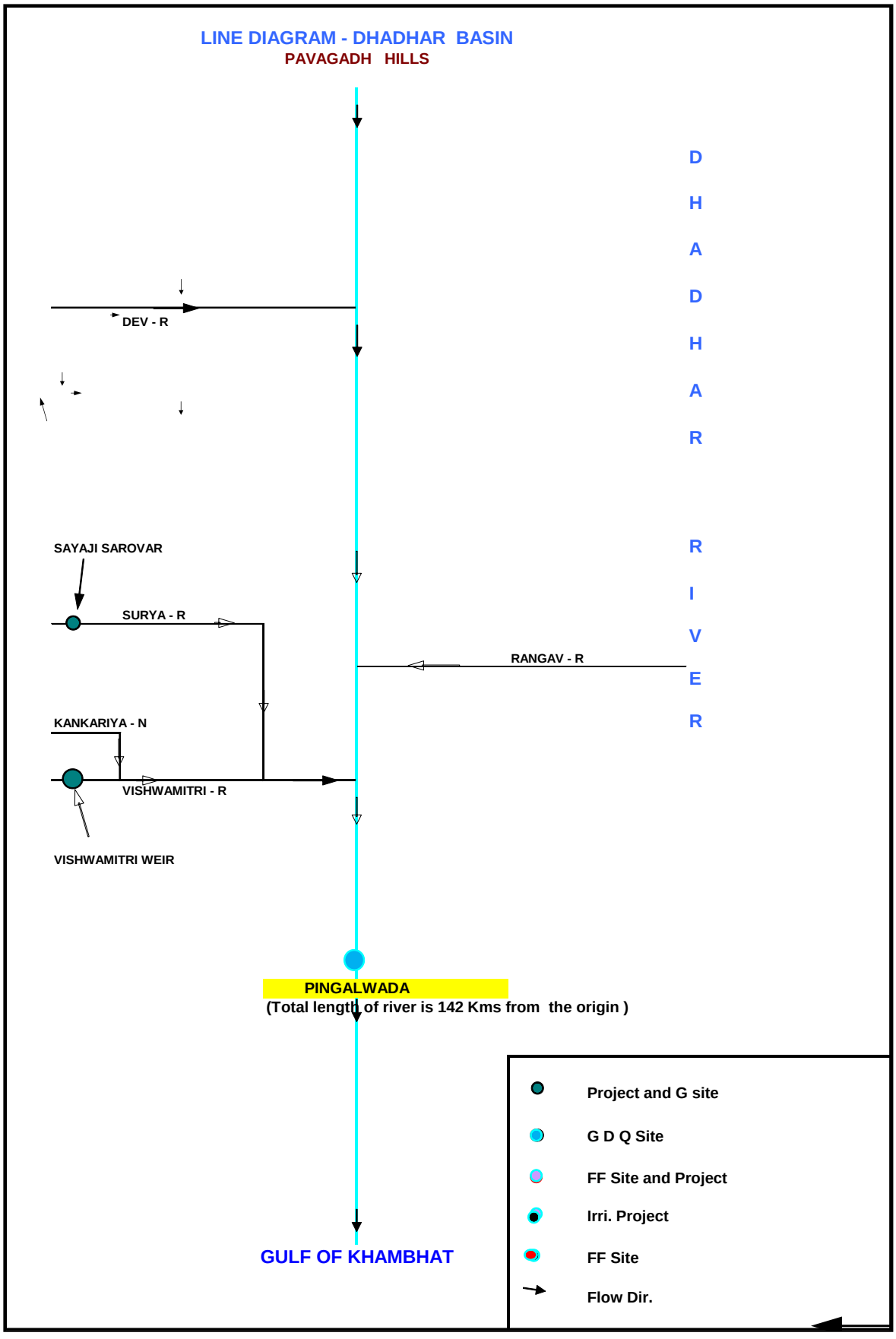
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

11. DHADAR BASIN

11.0 Dhadar Basin

11.1 Basin description

The Dhadhar River is one of the west flowing rivers in Gujarat state. Its basin map is enclosed. It originates from the Pavagadh Hills of Gujarat state and flows through Vadodara and Bharuch districts. The river Dhadhar after flowing 87 Km. receives Vishwamitri tributary from right bank at Pingalwada village 500 m. up stream of Gauge and Discharge site. After flowing another 55 km. it falls in to the Gulf of Khambhat. The total length of the river from its source to outfall in the Gulf of Khambhat is about 142 km.The important tributaries of the Dhadhar River are Vishwamitri, Jambuoriver, Dev and Surya River. The catchment area of the Dhadhar basin is 3423 Sq.km. and catchment area up to the site is 2400 Sq.km. It lies between east longitude 72° 30’ and 73° 45’ and North latitude 21° 45’ and 22° 45’.


LINE DIAGRAM - DHADHAR BASIN
PAVAGADH HILLS
D
H
A
D
H
A
R
R
I
V
E
R
DEV - R
SAYAJI SAROVAR
SURYA - R
RANGAV - R
KANKARIYA - N
VISHWAMITRI - R
VISHWAMITRI WEIR
PINGALWADA
(Total length of river is 142 Kms from the origin)
GULF OF KHAMBHAT
Project and G site
G D Q Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

11.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Dhadhar at Pingalwada**	**Code**	**:**	**01 02 14 001**
State	:	Gujarat	District		Vadodara
Basin	:	Narmada	Independent River	:	Dhadhar
Tributary	:	-	Sub Tributary	:	-
Sub-Sub Tributary	:	-	Local River	:	Dhadhar
Division	:	Tapi Dvision, Surat	Sub-Division	:	LNSD Bharuch
Drainage Area	:	2400 Sq. Km.	Bank	:	Right
Latitude	:	22°06'37" N	Longitude	:	73°04'44" E
		Opening Date	Closing Date		
Gauge	:	07/04/1989			
Discharge	:	30/06/1989			
Sediment	:				
Water Quality	:	15/03/1990			

Water Quality Datasheet for the period : 2015-2016

Station Name: Dhadhar at Pingalwada (01 02 14 001) — **Division: Tapi Division, Surat**

Local River: Dhadhar — **Sub Division: LNSD, Bharuch**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	2.210	8.680	33.53	5.962	5.270	7.752	7.285	5.899	5.502	6.636	6.460	4.953
2	Colour_Cod (-)	Green	Light	Brown	Light Green	Light Green	Light Green	Brown	Light Brown	Light Brown	Clear	Light Green	Light Brown
3	EC_FLD (µmho/cm)	1400	1400	500	140	500	600	1300	1200	1200	1300	1200	1300
4	EC_GEN (µmho/cm)	850	440	465	615	560	740	450	740	500	370	500	500
5	Odour_Code (-)	fishy	septic	odour free	odour	odour free	septic	septic	septic	septic	septic	septic	septic
6	pH_FLD (pH units)	6.5	6.0	7.0	6.5		6.5	7.0	7.0	7.0	7.0	6.5	8.4
7	pH_GEN (pH units)	7.9	7.5	8.2	7.7	7.8	7.5	7.5	7.9	7.6	7.9	7.8	7.5
8	SS (mg/L)	650	150	170	300	200	230	200	230	180	110	165	250
9	TDS (mg/L)	550	280	300	400	360	480	290	527	320	240	320	310
10	Temp (deg C)	27.0	24.0	23.0	24.0	23.0	24.0	18.0	24.0	14.0	16.0	19.0	25.0
11	TS (mg/L)		1130	568		1419	710		757	911	1004	1023	850
12	Turb (NTU)	2.0	2.0	16.0	1.0	8.0	2.0	2.0	2.0	1.0	2.0	4.0	2.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	116	95	130	210	182	246	90	240	107	113	120	105
3	Ca (mg/L)	36	32	32	85	52	96	40	96	42	36	40	30
4	Cl (mg/L)	64.0	73.0	55.0	64.0	60.0	55.0	70.0	75.0	70.0	60.0	62.0	65.0
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	F (mg/L)	0.14	0.12	0.12	0.10	0.15	0.13	0.14	0.14	0.12	0.13	0.12	0.12
7	HCO3 (mg/L)	142	116	159	256	222	300	110	293	130	138	146	128
8	K (mg/L)	4.2	4.8	4.4	3.6	3.8	3.6	3.8	4.2	4.4	4.3	3.8	4.4
9	Mg (mg/L)	9.7	7.3	16.0	9.7	17.0	7.3	7.3	7.3	8.5	9.7	7.3	8.5
10	Na (mg/L)	48.0	48.0	40.0	48.6	40.0	39.0	36.0	52.0	38.0	40.0	48.0	46.0
11	NH3-N (mg N/L)	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.11	0.14	0.14	0.12	0.10
12	NO2+NO3 (mg N/L)	0.29	0.17	0.16	0.18	0.20	0.20	0.20	0.18	0.18	0.20	0.22	0.16
13	NO2-N (mgN/L)	0.16	0.06	0.06	0.06	0.08	0.08	0.08	0.07	0.06	0.06	0.10	0.06
14	NO3-N (mgN/L)	0.13	0.11	0.10	0.12	0.12	0.12	0.12	0.11	0.12	0.14	0.12	0.10
15	P-Tot (mgP/L)	0.180	0.120	0.150	0.150	0.130	0.130	0.150	0.140	0.130	0.100	0.150	0.240
16	SiO2 (mg/L)	10.0	14.0	8.0	10.0	15.0	10.0	5.0	14.0	10.0	10.0	10.0	10.0
17	SO4 (mg/L)	12.0	7.0	15.0	34.0	5.0	4.0	8.0	8.0	4.0	5.0	12.0	10.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	3.0	5.3	1.8	0.4	2.0	2.6	2.9	2.5	1.0	4.3	3.9	0.8
2	COD (mg/L)	60.0	56.0	42.0	104.0	104.0	52.0	80.0	20.0	8.0	88.0	12.0	56.0
3	DO (mg/L)	0.0	3.2		1.0		3.5	0.0			2.0		
4	DO_SAT% (%)	0	38		12		42	0			20		
5	FCol-MPN (MPN/100mL)	1700	700	1200	500	700	900	500	900	1400	400	1500	300
6	Tcol-MPN (MPN/100mL)	3000	1400	2000	900	1600	2000	1200	2000	2000	1000	3200	700
	TRACE & TOXIC												
1	Al (mg/L)	0.10	0.06	0.12	0.12	0.05	0.08	0.12	0.11	0.09	0.06	0.06	0.09
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	90	80	80	212	130	240	100	240	105	90	100	75
2	HAR_Total (mgCaCO3/L)	131	111	147	252	201	271	131	271	140	131	131	111
3	Na% (%)	44	47	36	29	30	24	37	29	36	39	44	46
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	1.8	2.0	1.4	1.3	1.2	1.0	1.4	1.4	1.4	1.5	1.8	1.9
	PESTICIDES												

Water Quality Summary for the period 2015-2016

Station Name : Dhadhar at Pingalwada (01 02 14 001) **Division: Tapi Division, Surat**

Local River: Dhadhar **Sub-Division: LNSD,Bharuch**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	40.57	1.542	6.458
2	EC_FLD (µmho/cm)	12	1400	140	1003
3	EC_GEN (µmho/cm)	12	850	370	561
4	pH_FLD (pH units)	11	8.4	6.0	6.9
5	pH_GEN (pH units)	12	8.2	7.5	7.7
6	SS (mg/L)	12	650	110	236
7	TDS (mg/L)	12	550	240	365
8	Temp (deg C)	12	27.0	14.0	21.8
9	TS (mg/L)	9	1419	568	930
10	Turb (NTU)	12	16.0	1.0	3.7
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	12	246	90	146
3	Ca (mg/L)	12	96	30	51
4	Cl (mg/L)	12	75.0	55.0	64.4
5	CO3 (mg/L)	12	0.0	0.0	0
6	F (mg/L)	12	0.15	0.10	0.13
7	HCO3 (mg/L)	12	300	110	178
8	K (mg/L)	12	4.8	3.6	4.1
9	Mg (mg/L)	12	17.0	7.3	9.6
10	Na (mg/L)	12	52.0	36.0	43.6
11	NH3-N (mg N/L)	12	0.14	0.10	0.12
12	NO2+NO3 (mg N/L)	12	0.29	0.16	0.19
13	NO2-N (mgN/L)	12	0.16	0.06	0.08
14	NO3-N (mgN/L)	12	0.14	0.10	0.12
15	P-Tot (mgP/L)	12	0.240	0.100	0.148
16	SiO2 (mg/L)	12	15.0	5.0	10.5
17	SO4 (mg/L)	12	34.0	4.0	10.3
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	5.3	0.4	2.5
2	COD (mg/L)	12	104.0	8.0	56.8
3	DO (mg/L)	6	3.5	0.0	1.6
4	DO_SAT% (%)	6	42	0	19
5	FCol-MPN (MPN/100mL)	12	1700	300	892
6	Tcol-MPN (MPN/100mL)	12	3200	700	1750
	TRACE & TOXIC				
1	Al (mg/L)	12	0.12	0.05	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	240	75	129
2	HAR_Total (mgCaCO3/L)	12	271	111	169
3	Na% (%)	12	47	24	37
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	2.0	1.0	1.5
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2016

Station Name : Dhadhar at Pingalwada (01 02 14 001) — **Division: Tapi Division, Surat**

Local River: Dhadhar — **Sub-Division: LNSD, Bharuch**

S	Parameters	Flood											Winter											Summer										
		Jun - Oct											Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																	
1	Q (cumec)	161.	151.	123.	9.43	7.44	32.3	12.5	6.44	41.6	57.4	11.1	3.09	3.71	5.23	5.23	2.05	6.17	1.83	5.55	8.43	8.67	6.61	1.75	0.00	3.99	3.35	1.26	3.79	0.00	4.64	3.59	5.34	6.016
2	EC_FLD (µmho/cm)			483	880	1000	902	938	737	1123	726	788		1491	909	679	952	1098	1057	1063	1200	875	1075			1385	1206	1061	1173		1100	1100	1267	1267
3	EC_GEN (µmho/cm)	940	811	521	1246	1093	1044	1150	887	1172	780	586	1273	1282	1473	1329	1245	1177	920	1085	994	674	608	1460	1594	1480	1413	1413	1375	1329	1025	832	1117	457
4	pH_FLD (pH units)			7.2	6.9	6.8	6.1	6.5	6.9	6.9	6.8	6.5		7.8	7.0	6.7	6.7	6.6	6.5	6.8	6.6	6.6	6.9		7.5	7.2	6.8	6.5	6.6	6.3	6.9	6.7	7.0	7.3
5	pH_GEN (pH units)	8.1	7.8	7.5	7.3	7.4	7.5	7.0	7.1	6.9	7.6	7.8	7.7	7.8	7.9	7.1	7.5	7.5	6.7	6.7	7.7	6.8	7.6	7.8	7.9	7.3	8.0	7.6	7.3	8.0	6.8	8.2	7.6	7.7
6	SS (mg/L)	93	141	146	298	324	350	491	264	397	205	294	99	229	296	353	412	394	333	346	319	225	210	115	237	329	640	467	407	450	353	285	390	175
7	TDS (mg/L)	677	548	373	840	707	765	809	596	763	522	378	987	932	989	828	758	853	593	697	666	434	404	1236	1178	989	1044	946	886	867	686	542	732	290
8	Temp (deg C)	29.9	27.2	25.8	26.6	26.4	26.4	25.6	25.4	24.4	25.0	24.2	21.6	18.0	23.3	23.5	23.8	24.8	24.5	15.8	17.0	17.0	20.0	28.0	23.7	22.0	26.7	25.7	25.7	26.5	20.7	20.7	20.0	20.0
9	TS (mg/L)						1115	1306	885	1160	735	1039						1247	995	1041	984	659	793						1293	1317	1039	827	937	959
1	Turb (NTU)		7.5	7.3	2.0	2.8	8.0	2.0	18.0	3.4	2.6	5.8	1.0	1.3	1.0	1.8	1.5	0.8	1.5	2.0	2.8	3.3	1.8	1.3	1.7	1.3	3.0	2.0	1.3	2.0	2.0	2.3	1.7	2.7
	CHEMICAL																																	
1	Alk-Phen	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	2.5	8.9	0.0	0.0	0.0	0.0	1.7	0.0	0.0	4.2	0.0	8.6	8.0	0.0
2	ALK-TOT (mgCaCO3/L)	315	148	147	139	136	130	131	125	103	118	147	387	193	226	102	101	135	95	99	113	115	171	229	215	209	143	118	103	162	123	121	152	113
3	Ca (mg/L)	37	35	34	37	39	36	38	36	37	42	47	39	40	40	40	39	39	40	37	36	35	69	40	43	39	40	40	43	37	37	37	46	35
4	Cl (mg/L)	475.	119.	90.2	222.	190.	226.	208.	143.	104.	72.4	63.2	183.	163.	256.	268.	208.	234.	162.	99.6	129.	68.9	67.5	271.	215.	256.	295.	234.	284.	350.	77.9	108.	71.7	62.3
5	CO3 (mg/L)	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	1.5	0.0	0.0	1.5	0.0	0.0	3.0	10.8	0.0	0.0	0.0	0.0	2.0	0.0	0.0	5.0	0.0	10.3	9.7	0.0
6	F (mg/L)	0.13	0.11	0.14	0.10	0.37	0.24	0.18	0.31	0.24	0.16	0.13	0.05	0.05	0.06	0.35	0.30	0.23	0.29	0.33	0.21	0.20	0.13	0.11	0.05	0.08	0.35	0.37	0.30	0.60	0.25	0.27	0.12	0.12
7	HCO3 (mg/L)	384	181	179	169	166	158	160	153	126	137	179	472	235	273	125	123	162	116	121	132	119	208	279	262	255	171	143	126	188	151	126	166	137
8	K (mg/L)		4.4	5.8	7.2	10.3	16.4	14.5	16.6	7.6	4.4	4.2		10.3	12.7	18.5	11.6	24.3	24.9	4.4	7.6	4.3	4.0	7.8	12.4	10.6	27.0	16.1	20.0	47.0	3.9	4.3	4.1	4.2
9	Mg (mg/L)	10.7	8.4	9.5	11.7	11.9	12.4	11.1	11.9	6.5	8.3	12.0	11.7	12.3	11.8	12.2	11.9	12.1	8.5	11.1	8.1	9.7	7.6	12.0	13.6	11.7	12.3	12.6	11.6	11.2	8.2	10.0	16.2	8.5
1	Na (mg/L)		87.0	65.5	140.	133.	161.	140.	95.1	70.4	48.1	44.9		121.	182.	165.	131.	152.	102.	60.8	91.5	46.8	41.3	203.	152.	182.	211.	153.	169.	236.	59.0	78.3	48.2	44.7
1	NH3-N (mg N/L)	1.39	0.40	0.10	0.29	4.49	0.88	0.74	0.15	0.18	0.14	0.11	0.40	0.05	0.06	4.85	11.2	4.26	0.08	0.18	0.15	0.20	0.12	0.10	0.05	0.09	16.2	11.2	0.38	0.10	0.17	0.16	0.11	0.12
1	NO2+NO3 (mg N/L)	0.14	0.06	0.39	0.23	0.57	1.79	0.23	0.34	0.29	0.21	0.20	0.02	0.01	0.10	0.60	0.55	0.37	0.27	0.31	0.27	0.23	0.19	0.25	0.12	0.22	0.71	0.68	0.34	0.27	0.34		0.20	0.19
1	NO2-N (mgN/L)	0.00	0.00	0.04	0.04	0.07	0.48	0.04	0.13	0.09	0.08	0.08	0.00	0.00	0.01	0.05	0.09	0.06	0.08	0.12	0.11	0.08	0.07	0.03	0.00	0.05	0.06	0.06	0.05	0.02	0.12		0.07	0.07
1	NO3-N (mgN/L)	0.14	0.06	0.34	0.20	0.50	1.30	0.19	0.21	0.20	0.14	0.12	0.02	0.01	0.09	0.55	0.46	0.31	0.20	0.19	0.16	0.15	0.12	0.22	0.12	0.17	0.65	0.62	0.29	0.25	0.22	0.15	0.12	0.12
1	o-PO4-P (mg P/L)						0.24	0.05	0.06									0.05	0.07	0.07									0.06	0.09					
1	P-Tot (mgP/L)	1.08	0.62	0.33	0.91	1.12	0.68	0.92	0.56	0.29	0.22	0.14	1.33	1.06	1.31	1.58	1.40	1.19	0.57	0.46	0.21	0.25	0.13	1.08	0.88	0.74	1.99	2.17	1.30	0.44	0.46	0.23	0.15	0.163
1	SiO2 (mg/L)	25.6	25.8	25.6	28.5	26.8	26.5	21.9	15.2	9.6	9.8	11.4	23.8	22.4	27.6	26.1	18.9	23.4	10.0	12.5	10.0	8.9	9.8	21.7	23.6	28.0	24.3	19.0	25.3	10.0	8.7	10.7	8.7	10.0
1	SO4 (mg/L)	13.5	23.9	6.3	24.6	43.9	27.1	18.4	22.1	13.6	12.0	14.6	17.2	28.5	14.3	43.4	43.8	26.9	39.4	23.3	14.4	10.4	6.0	46.3	32.5	15.4	65.0	58.6	22.5	34.4	13.0	15.5	12.0	9.0
	BIOLOGICAL/BACTERI																																	
1	BOD3-27 (mg/L)	10.3	4.2	5.5	6.5	15.2	19.9	4.1	6.8	1.6	2.3	2.5	8.0	6.0	19.5	12.5	8.5	4.5	3.1	2.0	1.4	1.5	2.3	12.7	33.0	37.3	18.0	27.3	8.7	5.3	1.8	0.9	1.7	3.0
2	COD (mg/L)											73.2										68.0	40.0										54.0	52.0
3	DO (mg/L)			5.5	5.5	3.6	5.5	4.5	7.6	2.1	2.9	1.4		5.1	6.2	5.0	5.1	5.0	8.0	4.1	2.3	1.3	1.8			7.1	4.5	5.2	4.7		4.7	1.6	1.8	2.0
4	DO_SAT% (%)			70	69	45	68	55	90	25	34	17		62	72	59	60	61	96	40	24	13	21			81	56	63	57		53	17	22	20
5	FCol-MPN										2380	960									6000	2625	925								3267	1200	733
6	Tcol-MPN										5670	1780									3000	5150	1800								1106	2500	1633
	TRACE & TOXIC																																	
1	Al (mg/L)		0.13	0.13	0.07	0.12	0.15	0.12	0.16	0.15	0.17	0.09	0.02	0.08	0.15	0.10	0.10	0.13	0.08	0.11	0.17	0.14	0.10	0.07	0.07	0.26	0.11	0.06	0.11	0.10	0.13	0.16	0.13	0.07
	CHEMICAL INDICES																																	
1	HAR_Ca (mgCaCO3/L)	93	87	86	92	98	91	94	89	92	104	118	98	99	100	99	99	98	100	91	90	88	172	99	107	97	100	100	107	93	92	94	114	89
2	HAR_Total	138	122	126	141	148	142	140	138	119	139	168	147	150	149	150	148	148	135	138	124	128	203	149	163	146	152	153	155	139	126	135	182	124
3	Na% (%)		50	48	65	63	59	64	54	54	42	37		62	71	66	64	64	57	48	58	43	31	74	65	71	67	66	67	72	50	55	37	43
4	RSC (-)	3.6	0.6	0.5	0.4	0.1	0.4	0.2	0.0	0.1	0.0	0.0	4.8	0.9	1.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.6	1.0	1.3	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.0
5	SAR (-)		3.3	2.5	5.1	4.8	5.8	5.1	3.5	2.8	1.8	1.6		4.3	6.5	5.9	4.7	5.5	3.9	2.3	3.6	1.8	1.3	7.3	5.2	6.6	7.5	5.4	5.9	8.8	2.3	2.9	1.6	1.8
	PESTICIDES																																	

Pesticides, Trace and Toxic element analysis

Station Name: Dhadhar at Pingalwada (01 02 14 001) **Division: Tapi Division, surat**

Local River: Dhadhar **Sub Division: LNSD, Bharuch**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	**2.375**	-	**1.48**	POOLING CONDITION	**1.095**	**1.07**	**14.94**	**8.6**	**0.1044**	**5.08**	**1.502**	**4.51**	-	-	**2.584**	**0.00075**	0.00045	0.4141
2	Cd	Cadmium	microgram / l	-	-	**1.78**	**2.89**	**2.624**	**1.380**	**0.263**		**0.880**	**0.05**	**0.14**	**0.31**	**2.190**	**0.20**	**0.000**	**0.14**	**0.110**	**0.01**	**2.000**	**0.00032**	0.00019	0
3	Cr	Chromium	microgram / l	-	-	**0**	**0**	**0**	**2.09**	**6.31**		**0**	**13.56**	**3.27**	**1.54**	**2.31**	**8.96**	**0**	**0.45**	**11.880**	**0.01**	**0.000**	**0.02986**	0.00123	0
4	Cu	Copper	microgram / l	-	-	-	-	-	-	**24.2**		-	**4.00**	**4.55**	**8.13**	-	**21.67**	-	**12.97**	**0.270**	**0.01**	-	**0.00392**	0.00128	
5	Hg	Mercury	microgram / l	-	-	**0**	-	-	-	**0.54**		**0.5598**	-	-	**0.36**	**0.0841**	**0.22**	**0.13**	-	-	-	**0.193**			0
6	Ni	Nickel	microgram / l	-	-	**19.67**	**3.92**	**8.33**	**11.34**	-		**6.56**	**8.64**	**6.81**	**33.51**	**8.37**	**1.54**	**0.00**	**4.16**	**1.360**	**0.018**	**8.040**	**0.00342**	0.00265	2.3
7	Pb	Lead	microgram / l	-	-	**35.29**	**52.17**	**0.00**	**6.56**	**9.15**		**30.76**	**5.78**	**2.51**	**2.45**	**0.00**	**2.06**	**85.30**	**1.944**	**1.670**	**0.014**	**16.000**	**0.00026**	0.00078	0
8	Zn	Zinc	microgram / l	-	-	**31.81**	**37.05**	**73.39**	**355.1**	-		**37.97**	**288.0**	**9.75**	**23.60**	**20.16**	**0.02**	**28.3**	**26.00**	**0.026**	**0.01**	**13.000**	**0.00342**	0.0242	11.85
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	**0**	**0.0034**	**0.0097**	**0.03**	-		**0.0154**	-	-	-	Pesticides value not reported.	-	-	-	-	-	-			
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	**0.21**	**0.004**	**0.0372**	**0**	-		**0.0381**	-	-	-		-	-	-	-	-	-			
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-			
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-			
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-			
6	DDT	DDT	microgram / l	-	-	**0.02**	**0.0034**	**0.0027**	**0**	-		**0.0034**	-	-	-		-	-	-	-	-	-			
7	Dieldrin	Dieldrin	microgram / l	-	-	**0**	**0.0033**	**0.0033**	**0.026**	-		**0.0038**	-	-	-		-	-	-	-	-	-			
8	Endos-I	Endosulphan I	microgram / l	-	-	**0.03**	**0.005**	**0.0213**	**0.165**	-		**0.1099**	-	-	-		-	-	-	-	-	-			
9	Endos-II	Endosulphan II	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-			
10	Endos-s	Endosulphan s	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-			

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

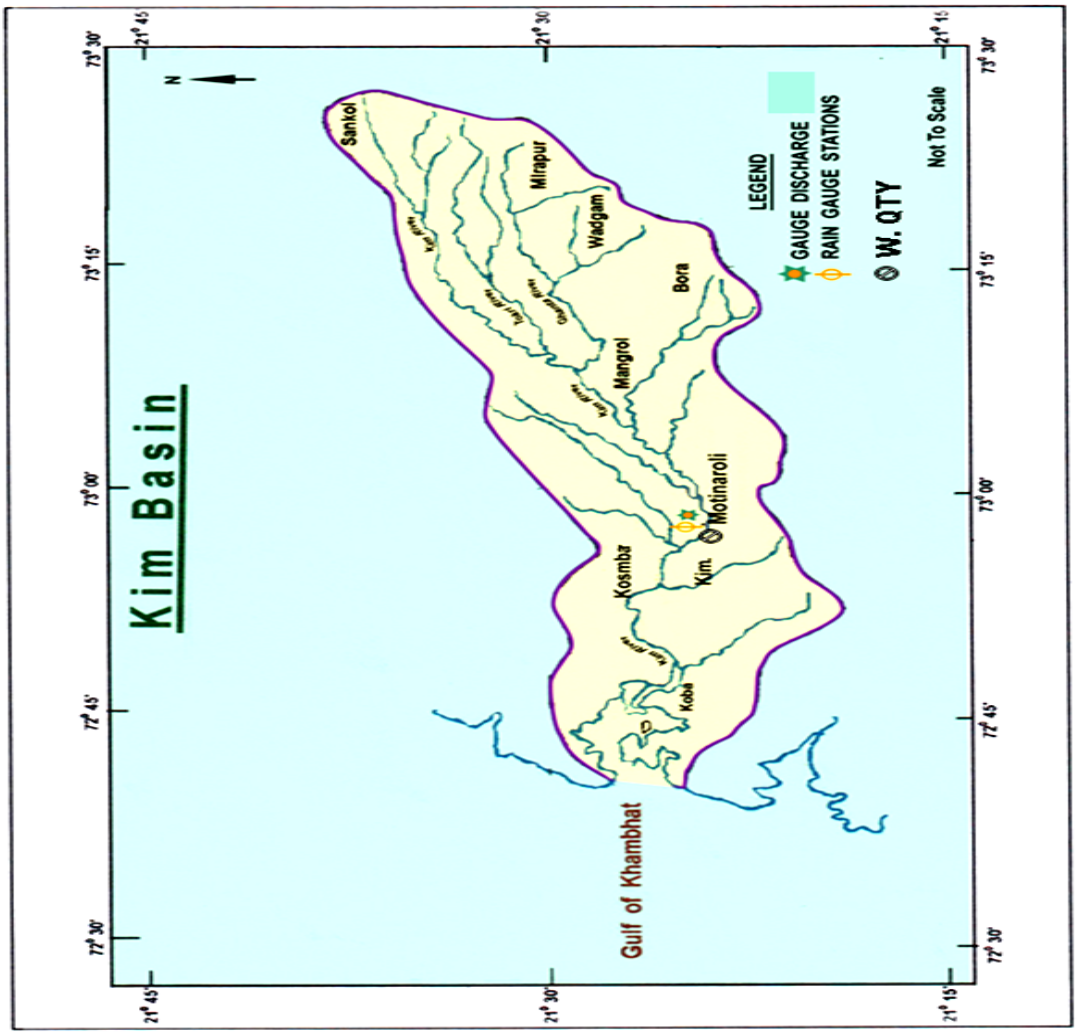
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

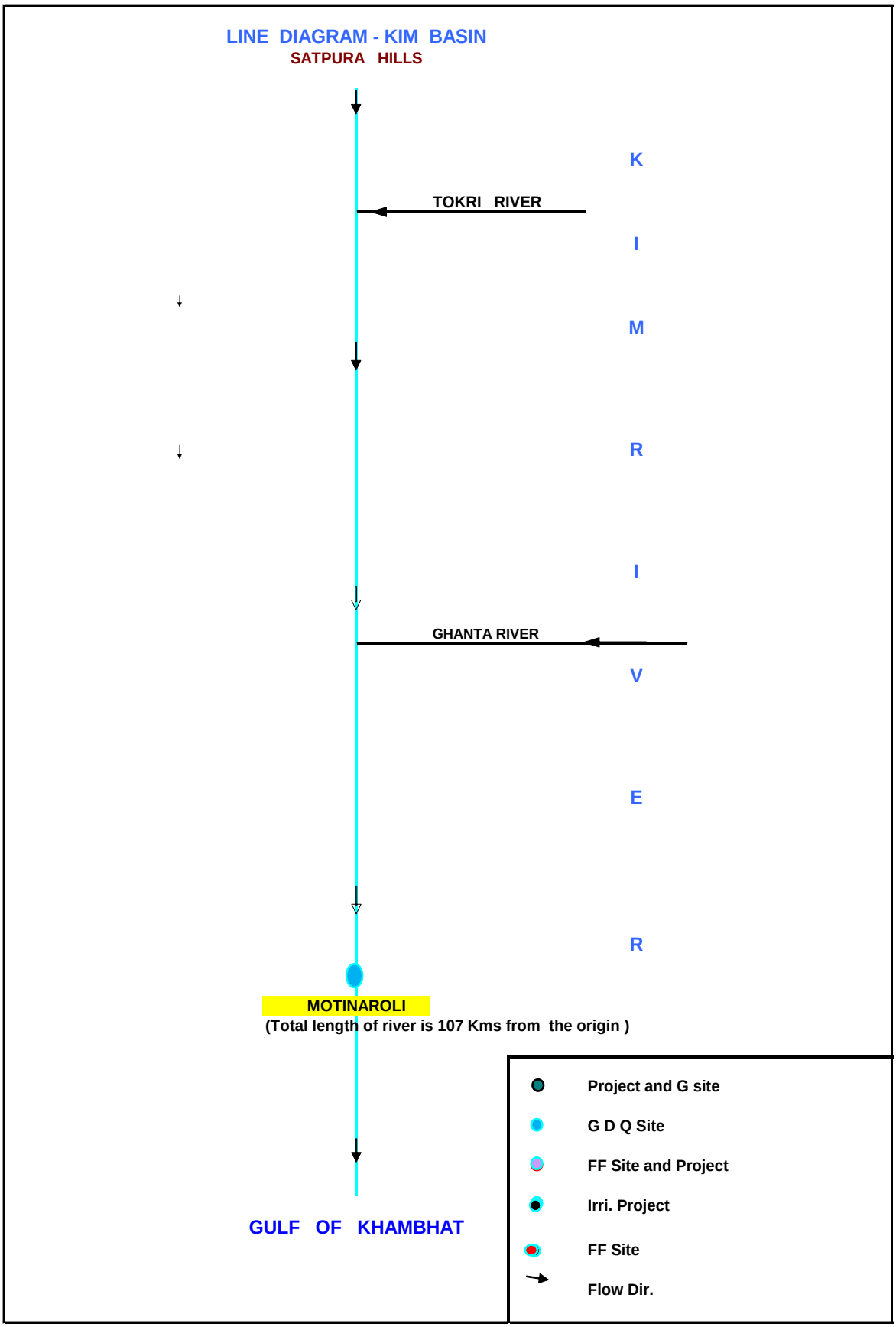
12. KIM BASIN

12.0 Kim Basin

12.1 Basin Description

Kim River is one of the west flowing rivers in Gujarat state. Its basin map is enclosed. It originates from Satpura Hill ranges in Bharuch district and falls in Gulf of Khambhat near village Kantiajal of Hansot taluka of Bharuch district after flowing south west direction for a length of 107 km. The river Kim, for the first 80 km. of its course passes through Rajpipala and Valia talukas. For the remaining the river flows in a western direction between Ankleshwar and Olpad taluka of Surat District. The main tributaries of Kim river is Ghanta river and Tokri river. The river basin extends over an area of 1286 Sq.km. of which the catchment area up to the site is 804 sq km. The river basin lies between21° 19’ to 21° 38’ North latitude and 72° 40’ to 73° 27’ East longitude.




LINE DIAGRAM - KIM BASIN
SATPURA HILLS
K
TOKRI RIVER
I
M
R
I
GHANTA RIVER
V
E
R
MOTINAROLI
(Total length of river is 107 Kms from the origin)
GULF OF KHAMBHAT
Project and G site
G D Q Site
FF Site and Project
Irri. Project
FF Site
Flow Dir.

12.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2015-2016**
Site	**:**	**Kim at Motinaroli**	**Code**	**:**	**01 02 16 001**
State	:	Gujarat	District		Surat
Basin	:	Narmada	Independent River	:	Kim
Tributary	:	-	Sub Tributary	:	-
Sub-Sub Tributary	:	-	Local River	:	Kim
Division	:	Tapi Dvision, Surat	Sub-Division	:	LNSD Bharuch
Drainage Area	:	804 Sq. Km.	Bank	:	Right
Latitude	:	21°24'16" N	Longitude	:	72°57'48" E
		Opening Date	Closing Date		
Gauge	:	17/10/1990			
Discharge	:	17/10/1990			
Sediment	:				
Water Quality	:	01/07/1991			

Water Quality Datasheet for the period : 2015-2016

Station Name: Kim at Motinaroli (01 02 16 001) — **Division: Tapi Division, Surat**

Local River: Kim — **Sub Division: LNSD, Bharuch**

S.No	Parameters	01/06/2015	01/07/2015	01/08/2015	01/09/2015	01/10/2015	02/11/2015	01/12/2015	01/01/2016	01/02/2016	01/03/2016	01/04/2016	02/05/2016
	PHYSICAL												
1	Q (cumec)	5.943	4.123	40.91	12.11	9.188	9.342	9.855	0.000	7.848	4.361	4.298	8.714
2	Colour_Cod (-)	Clear	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	700	700						840				
4	EC_GEN (µmho/cm)	425	480	470	540	470	570	481	770	400	460	375	280
5	Odour_Code (-)	odour free	odour	odour free	odour	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	8.1	8.2	8.6	7.4		8.3	8.4	8.2	8.2	6.5	8.1	6.5
7	pH_GEN (pH units)	8.0	8.0	8.2	7.5	8.0	8.2	7.8	8.1	7.9	8.2	8.0	7.8
8	SS (mg/L)	200	160	260	160	150	184	170	240	140	170	110	100
9	TDS (mg/L)	270	310	310	350	300	368	311	480	260	300	240	180
10	Temp (deg C)	29.0	29.0	27.0	30.0	27.0	29.0	26.0	29.0	20.0	23.0	23.0	25.0
11	TS (mg/L)		996	787		1169	552		720	540	978	680	610
12	Turb (NTU)	1.0	1.0	6.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	110	110	120	170	180	164	170	170	103	120	100	95
3	Ca (mg/L)	30	32	26	70	52	60	34	58	32	36	28	28
4	Cl (mg/L)	60.0	68.0	60.0	60.0	80.0	53.0	53.0	85.0	61.0	50.0	55.0	65.0
5	CO3 (mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	F (mg/L)	0.14	0.14	0.14	0.12	0.14	0.12	0.13	0.12	0.13	0.12	0.12	0.14
7	HCO3 (mg/L)	134	134	146	207	220	200	207	207	126	146	122	116
8	K (mg/L)	2.8	2.8	4.2	2.8	4.2	2.8	4.6	2.8	4.0	4.2	4.0	4.2
9	Mg (mg/L)	10.9	9.7	15.8	2.9	17.0	4.9	15.8	13.4	9.7	7.3	7.3	5.0
10	Na (mg/L)	42.0	53.0	42.0	46.6	44.0	40.0	40.8	50.0	40.0	36.0	40.0	50.0
11	NH3-N (mg N/L)	0.13	0.13	0.13	0.08	0.10	0.13	0.14	0.12	0.12	0.13	0.11	0.12
12	NO2+NO3 (mg N/L)	0.24	0.24	0.18	0.28	0.26	0.19	0.19	0.21	0.22	0.20	0.16	0.17
13	NO2-N (mgN/L)	0.12	0.10	0.05	0.15	0.10	0.06	0.06	0.08	0.08	0.08	0.06	0.05
14	NO3-N (mgN/L)	0.12	0.14	0.13	0.13	0.16	0.13	0.13	0.13	0.14	0.12	0.10	0.12
15	P-Tot (mgP/L)	0.140	0.140	0.140	0.140	0.160	0.140	0.130	0.120	0.100	0.120	0.140	0.140
16	SiO2 (mg/L)	8.0	10.0	6.8	6.0	6.0	6.0	10.0	15.0	10.0	6.0	10.0	8.0
17	SO4 (mg/L)	10.0	10.0	12.0	25.0	5.0	4.0	10.0	12.0	6.0	7.0	6.0	10.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	0.8	0.5	0.5	0.2	1.1	1.6	2.0	3.3	3.7	1.6	0.8	0.5
2	COD (mg/L)	40.0	40.0	22.0	144.0	80.0	36.0	32.0	60.0	12.0	40.0	24.0	28.0
3	DO (mg/L)	6.2		7.2	5.9		6.9	6.9	6.9	6.9	6.9	6.9	6.9
4	DO_SAT% (%)	81		90	78		90	85	90	76	80	80	84
5	FCol-MPN (MPN/100mL)	400	500	500	700	400	700	500	300	600	700	800	500
6	Tcol-MPN (MPN/100mL)	600	1200	1000	1100	800	1200	1000	800	1200	1200	1800	1000
	TRACE & TOXIC												
1	Al (mg/L)	0.05	0.08	0.06	0.08	0.10	0.06	0.05	0.12	0.11	0.11	0.07	0.11
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	75	80	65	175	130	150	85	145	80	90	70	70
2	HAR_Total (mgCaCO3/L)	121	121	131	188	201	171	151	201	121	121	101	91
3	Na% (%)	42	48	40	35	32	33	36	35	41	38	45	53
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1
5	SAR (-)	1.7	2.1	1.6	1.5	1.4	1.3	1.4	1.5	1.6	1.4	1.7	2.3
	PESTICIDES												

Water Quality Summary for the period 2015-2016

Station Name : Kim at Motinaroli (01 02 16 001) **Division: Tapi Division, Surat**

Local River: Kim **Sub-Division: LNSD,Bharuch**

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	365	538.4	0.000	13.26
2	EC_FLD (µmho/cm)	3	840	700	747
3	EC_GEN (µmho/cm)	12	770	280	477
4	pH_FLD (pH units)	11	8.6	6.5	7.9
5	pH_GEN (pH units)	12	8.2	7.5	8
6	SS (mg/L)	12	260	100	170
7	TDS (mg/L)	12	480	180	307
8	Temp (deg C)	12	30.0	20.0	26.4
9	TS (mg/L)	9	1169	540	781
10	Turb (NTU)	12	6.0	1.0	1.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	12	180	95	134
3	Ca (mg/L)	12	70	26	41
4	Cl (mg/L)	12	85.0	50.0	62.5
5	CO3 (mg/L)	12	0.0	0.0	0
6	F (mg/L)	12	0.14	0.12	0.13
7	HCO3 (mg/L)	12	220	116	164
8	K (mg/L)	12	4.6	2.8	3.6
9	Mg (mg/L)	12	17.0	2.9	10
10	Na (mg/L)	12	53.0	36.0	43.7
11	NH3-N (mg N/L)	12	0.14	0.08	0.12
12	NO2+NO3 (mg N/L)	12	0.28	0.16	0.21
13	NO2-N (mgN/L)	12	0.15	0.05	0.08
14	NO3-N (mgN/L)	12	0.16	0.10	0.13
15	P-Tot (mgP/L)	12	0.160	0.100	0.134
16	SiO2 (mg/L)	12	15.0	6.0	8.5
17	SO4 (mg/L)	12	25.0	4.0	9.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	3.7	0.2	1.4
2	COD (mg/L)	12	144.0	12.0	46.5
3	DO (mg/L)	10	7.2	5.9	6.8
4	DO_SAT% (%)	10	90	76	83
5	FCol-MPN (MPN/100mL)	12	800	300	550
6	Tcol-MPN (MPN/100mL)	12	1800	600	1075
	TRACE & TOXIC				
1	Al (mg/L)	12	0.12	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	175	65	101
2	HAR_Total (mgCaCO3/L)	12	201	91	143
3	Na% (%)	12	53	32	40
4	RSC (-)	12	0.4	0.0	0
5	SAR (-)	12	2.3	1.3	1.6
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2016

Station Name : Kim at Motinaroli (01 02 16 001) | **River Water Analysis** | **Division: Tapi Division, Surat**

Local River: Kim | **Sub-Division: LNSD, Bharuch**

	Parameters	Flood											Winter										Summer										
		Jun - Oct											Nov - Feb										Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	3015 - 2016	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	PHYSICAL																																
1	Q (cumec)	100.0	110.7	186.8	11.14	7.799	9.513	11.94	5.698	50.40	182.4	14.4	3.795	3.713	3.124	2.836	2.492	2.968	1.925	1.899	9.454	8.095	6.76	4.529	3.083	3.384	3.184	2.051	1.727	0.851	0.439	4.258	3.448	5.791
2	EC_FLD (µmho/cm)			443	699	653	765	715	563	800	468	700		693	921	777	645	673	726	550	1025	750	840		575	561	567	493	717	600	950	900	700	
3	EC_GEN (µmho/cm)	520	445	480	837	812	790	673	548	927	512	477	882	917	1167	1214	1159	690	765	595	1231	727	555	539	790	662	611	632	755	666	608	686	760	372
4	pH_FLD (pH units)			8.0	7.4	7.0	7.0	7.5	7.6	7.6	8.0	8.1		7.9	8.2	7.0	6.9	7.5	8.0	8.0	7.8	8.2	8.3	7.0	8.1	7.4	7.3	7.0	6.7	6.5	7.9	7.0	8.1	7.0
5	pH_GEN (pH units)	8.3	8.0	8.0	7.7	7.9	7.8	7.7	7.7	8.0	8.3	8.0	8.2	8.0	8.2	7.6	7.8	7.9	7.5	7.9	8.3	8.1	8.0	8.0	8.1	7.6	7.8	7.9	7.6	7.8	7.9	8.3	8.1	8.0
6	SS (mg/L)	78	127	172	253	241	205	228	180	310	168	186	84	200	232	337	412	230	245	200	453	222	184	109	205	200	221	228	297	210	215	197	213	127
7	TDS (mg/L)	374	304	311	560	517	534	467	363	598	339	308	733	650	777	758	715	453	488	405	783	466	355	440	485	437	424	422	489	540	414	427	513	240
8	Temp (deg C)	30.9	34.5	32.4	29.2	29.2	29.6	30.3	29.4	29.0	28.6	28.4	24.1	31.3	21.5	22.8	22.5	25.0	27.0	20.5	22.8	19.0	26.0	30.7	29.5	26.0	28.0	26.3	27.3	28.5	27.5	20.7	23.3	23.7
9	TS (mg/L)						739	695	543	908	507	984						683	733	605	1235	687	604						872	641	629	624	777	756
1	Turb (NTU)		20.5	16.3	1.8	4.0	0.6	2.3	2.6	6.0	6.8	3.0	1.0	1.0	1.0	1.3	1.0	0.3	1.5	1.5	1.3	1.3	1.0	1.0	1.0	1.0	2.3	1.0	0.6	1.0	1.0	1.7	1.3	1.0
	CHEMICAL																																
1	Alk-Phen	5.2	2.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	5.5	0.0	4.3	0.0	3.7	0.0	0.0	0.0	0.0	0.0	2.5	11.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	4.2	0.0	1.7	5.3	0.0
2	ALK-TOT (mgCaCO3/L)	176	103	117	129	110	132	111	102	87	105	138	222	136	181	125	136	95	85	85	97	129	152	174	122	123	120	117	100	134	90	108	100	105
3	Ca (mg/L)	35	32	31	36	37	39	34	34	33	37	42	36	38	38	38	37	37	36	37	35	37	46	37	34	34	37	37	44	37	34	37	33	31
4	Cl (mg/L)	91.1	64.9	51.9	111.	117.	279.	108.	167.	75.6	66.8	65.6	154.	132.	149.	243.	171.	170.	132.	85.4	111.	71.9	63.0	85.3	121.	68.0	194.	145.	190.	214.	80.1	106.	66.0	56.7
5	CO3 (mg/L)	3.2	2.4	1.2	1.2	1.2	0.0	0.0	0.0	1.2	6.6	0.0	2.5	0.0	4.5	0.0	0.0	0.0	0.0	0.0	3.0	13.3	0.0	0.0	2.0	0.0	0.0	0.0	0.0	5.0	0.0	2.0	6.3	0.0
6	F (mg/L)	0.21	0.19	0.12	0.09	0.28	0.20	0.14	0.25	0.18	0.16	0.14	0.10	0.05	0.06	0.26	0.29	0.22	0.29	0.30	0.20	0.14	0.12	0.05	0.07	0.06	0.37	0.37	0.27	0.15	0.15	0.23	0.12	0.13
7	HCO3 (mg/L)	215	121	140	133	132	161	135	125	104	114	168	271	166	211	152	166	116	104	104	113	131	185	212	144	151	146	142	122	153	110	127	109	128
8	K (mg/L)		0.8	3.1	2.8	4.2	13.5	10.1	6.8	6.2	4.4	3.4		2.0	3.4	10.0	7.4	11.4	12.4	3.3	5.5	4.4	3.5	1.0	4.7	1.0	1.7	10.2	18.2	19.8	2.7	3.7	3.5	4.1
9	Mg (mg/L)	9.9	7.6	7.2	9.5	11.3	11.4	10.3	9.5	6.1	5.8	11.3	10.4	11.2	10.9	11.9	10.4	11.3	7.7	8.8	7.9	12.2	10.9	11.0	9.7	8.8	11.7	11.7	10.4	11.5	7.8	9.1	18.3	6.5
1	Na (mg/L)		46.6	36.2	74.9	76.1	202.	72.9	110.	48.5	47.1	45.5		93.4	109.	150.	114.	99.3	82.1	48.5	75.1	45.4	42.7	73.1	83.0	50.5	126.	95.8	110.	150.	50.1	70.3	46.3	42.0
1	NH3-N (mg N/L)	0.53	0.32	0.13	0.26	0.56	0.41	0.23	0.16	0.15	0.15	0.11	0.20	0.10	0.10	0.08	0.07	0.07	0.11	0.17	0.17	0.14	0.13	0.05	0.08	0.08	0.58	0.07	0.08	0.15	0.12	0.17	0.12	0.12
1	NO2+NO3 (mg N/L)	0.13	0.05	0.29	0.14	0.29	0.24	0.15	0.19	0.24	0.18	0.24	0.13	0.02	0.14	0.28	0.30	0.22	0.23	0.32	0.26	0.20	0.20	0.06	0.03	0.16	0.40	0.33	0.22	0.23	0.24		0.21	0.18
1	NO2-N (mgN/L)	0.00	0.00	0.04	0.03	0.04	0.03	0.03	0.07	0.08	0.07	0.10	0.02	0.00	0.01	0.04	0.03	0.05	0.07	0.12	0.10	0.08	0.07	0.00	0.00	0.03	0.03	0.05	0.06	0.01	0.08		0.08	0.06
1	NO3-N (mgN/L)	0.13	0.05	0.25	0.11	0.25	0.21	0.12	0.12	0.16	0.12	0.14	0.11	0.02	0.13	0.24	0.27	0.16	0.16	0.20	0.16	0.12	0.13	0.06	0.03	0.13	0.37	0.27	0.16	0.22	0.16	0.15	0.14	0.11
1	o-PO4-P (mg P/L)						0.08	0.05	0.07									0.06	0.05	0.08									0.06	0.08				
1	P-Tot (mgP/L)	0.30	0.16	0.21	0.24	0.48	0.37	0.27	0.27	0.26	0.19	0.14	0.13	0.27	0.67	0.37	0.52	0.29	0.99	0.85	0.21	0.22	0.12	0.08	0.07	0.09	0.74	0.35	0.70	0.81	0.23	0.25	0.15	0.133
1	SiO2 (mg/L)	22.4	23.3	23.4	26.2	24.6	23.6	11.8	11.2	7.6	9.3	7.4	19.3	21.9	26.1	24.2	15.0	17.6	12.8	15.0	9.7	8.6	10.3	18.4	21.8	26.1	20.9	14.6	20.4	12.0	9.0	10.2	6.6	8.0
1	SO4 (mg/L)	30.1	21.7	6.6	17.7	27.1	13.4	19.4	11.9	12.5	13.4	12.4	25.3	37.6	8.4	20.2	26.5	11.4	21.1	18.5	13.6	8.7	8.0	8.7	15.7	6.4	27.1	23.0	13.5	21.3	12.0	13.0	8.0	7.7
	BIOLOGICAL/BACTERI																																
1	BOD3-27 (mg/L)	2.1	0.6	2.3	3.6	3.6	8.5	1.9	1.0	1.8	1.6	0.6	3.3	2.9	4.5	10.8	2.7	8.8	9.5	1.4	1.5	2.9	2.6	0.6	4.7	0.7	1.5	1.1	3.9	1.1	1.3	2.6	2.3	1.0
2	COD (mg/L)											65.2										40.0	35.0										32.7	30.7
3	DO (mg/L)			9.3	8.5					6.6	7.4	6.4		7.0	8.0	8.2	6.7	7.5			5.9	6.6	6.9		6.8	7.8	7.5	7.2			6.1	6.1	6.1	6.9
4	DO_SAT% (%)			129	110					85	95	83		95	93	96	76	84			68	71	85		88	96	97	89			82	68	72	81
5	FCol-MPN										840	500									1200	425	525									933	467	667
6	Tcol-MPN										1680	940									6000	950	1050									2333	900	1333
	TRACE & TOXIC																																
1	Al (mg/L)		0.13	0.08	0.06	0.08	0.09	0.10	0.12	0.11	0.14	0.07	0.01	0.03	0.07	0.07	0.03	0.14	0.08	0.10	0.17	0.15	0.08	0.04	0.05	0.09	0.05	0.03	0.08	0.09	0.15	0.15	0.08	0.10
	CHEMICAL INDICES																																
1	HAR_Ca (mgCaCO3/L)	88	80	78	91	92	96	85	84	83	92	105	89	95	95	94	92	92	90	93	86	93	115	92	86	86	93	92	109	91	85	94	82	77
2	HAR_Total	129	112	108	130	139	144	128	123	108	116	152	133	142	141	143	136	139	122	129	119	143	161	138	126	123	142	140	152	139	118	131	158	104
3	Na% (%)		38	37	51	53	69	52	56	46	46	40		57	58	67	61	58	56	43	56	41	36	55	57	47	65	58	58	67	47	52	39	46
4	RSC (-)	1.1	0.0	0.3	0.1	0.0	0.3	0.0	0.1	0.0	0.0	0.0	1.9	0.1	0.8	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
5	SAR (-)		1.8	1.5	2.8	2.8	7.6	2.9	4.3	2.0	1.9	1.6		3.4	3.9	5.5	4.3	3.7	3.2	1.9	3.0	1.7	1.5	2.8	3.2	2.0	4.6	3.5	3.9	5.6	2.0	2.7	1.7	1.8
	PESTICIDES																																

Pesticides, Trace and Toxic element analysis

Station Name: Kim at Motinaroli (01 02 16 001) **Division: Tapi Division, surat**

Local River: Kim **Sub Division: LNSD, Bharuch**

Sl. No.	Parameter ID	Parameter Name	unit	Date of sampling																				
				01-04-2006	02-04-2007	02-04-2008	01-04-2009	01-04-2010	01-04-2011	01-09-2011	01-02-2012	02-04-2012	28-05-2012	01-10-2012	01-03-2013	01-04-2013	01-08-2013	01-04-2014	08-05-2014	01-11-2014	02-02-2015	01-04-2015	1-08-2015	1-12-2015	1-04-2016
a	Trace and Toxic			Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi	Analysis done by NRWQL, New Delhi	Analysis done by WQL-III Lab, UGD, Hyderabad
1	As	Arsenic	microgram / l	-	-	-	-	1.30	-	1.23	POOLING CONDITION	1.25	0.46	15.9	8.63	POOLING CONDITION	5.69	1.88	1.24	-	-	1.725	0.00081	0.0056	0.2071
2	Cd	Cadmium	microgram / l	-	-	0.95	2.34	0.00	0.05	0.015		0.52	0.03	0.13	0.12		0.23	0.00	0.02	0.73	0.02	2.000	0.00008	0.00015	0
3	Cr	Chromium	microgram / l	-	-	0	0	0	0	3.73		0	17.48	4.98	0.59		5.88	0	0.94	13.51	0.013	0.000	0.04248	0.00054	0
4	Cu	Copper	microgram / l	-	-	-	-	-	-	10.04		-	2.95	5.07	7.03		23.29	-	5.41	7.26	0.01	-	0.0063	0.00117	
5	Hg	Mercury	microgram / l	-	-	0	-	-	-	0.53		0.252	-	-	0.46		0.69	0.118	-	-	-	0.188	–		0
6	Ni	Nickel	microgram / l	-	-	11.79	0.00	1.61	1.98	-		2.806	1.60	8.96	13.24		6.62	0.000	4.53	0.91	0.004	8.590	0.00394	0.00169	0.8
7	Pb	Lead	microgram / l	-	-	20.81	37.89	0.00	0.00	0.57		23.77	5.12	2.84	1.32		1.68	55.40	3.28	0.73	0.009	16.000	0.00026	0.0003	0
8	Zn	Zinc	microgram / l	-	-	32.03	16.67	7.29	27.56	11.10		16.55	39.0	18.87	9.30		0.02	27.70	14.00	0.01	0.006	16.600	0.00394	0.0095	4.41
b	Pesticides		microgram / l																						
1	Aldrin	Aldrin	microgram / l	-	-	0	0.0057	0.0044	0	-		0.001	-	-	-		-	-	-	-					
2	Alpha-BHC	Alpha- BHC	microgram / l	-	-	0	0.0022	0.2075	0.655	-		0.007	-	-	-		-	-	-	-					
3	Beta-BHC	Beta-BHC	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-					
4	Gama-BHC	gamma-BHC (Benzene	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-					
5	D- BHC	D- BHC	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-					
6	DDT	DDT	microgram / l	-	-	0	0.0009	0.0034	0	-		0.0015	-	-	-		-	-	-	-					
7	Dieldrin	Dieldrin	microgram / l	-	-	0	0.0008	0.0028	0	-		0	-	-	-		-	-	-	-					
8	Endos-I	Endosulphan I	microgram / l	-	-	0	0.0051	0.0509	0.118	-		0.0314	-	-	-		-	-	-	-					
9	Endos-II	Endosulphan II	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-					
10	Endos-s	Endosulphan s	microgram / l	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-					

WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides

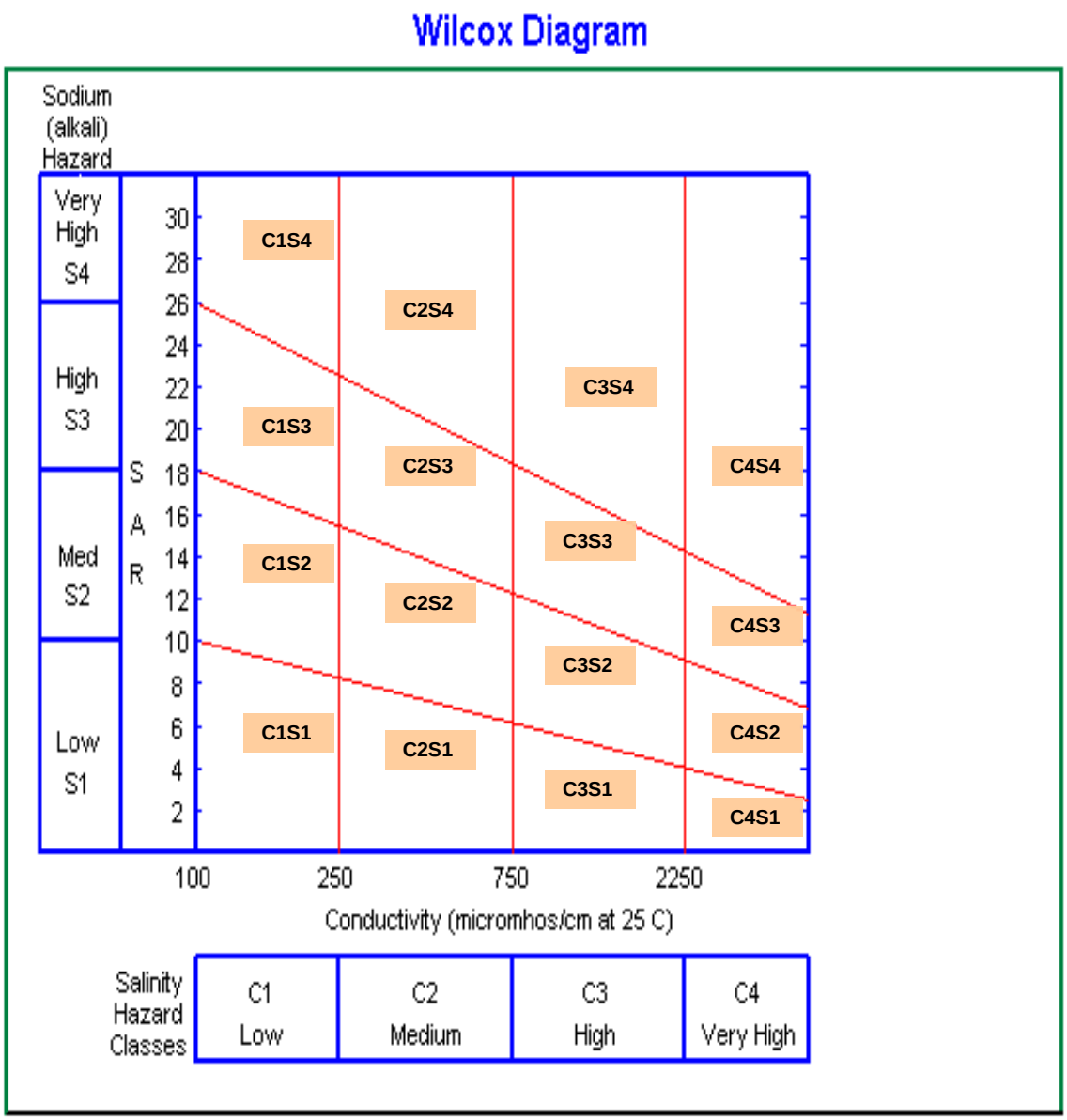
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

ANNEXURE

Annex-I

U.S. SALINITY DIAGRAM FOR THE

CLASSIFICATION OF IRRIGATION WATERS



NOTE;- (AFTER RICHARDS, E.D.,U.S.D.A. AGR.HANDB.60, 1954, P 807)

- SAR – SODIUM ADSORPTION RATIO

Annex-II

TOLERANCE LIMITS OF THE SELECTED WATER QUALITY PARAMETERS FOR DIFFERENT USES AS PRESCRIBED BY THE BUREAU OF INDIAN STANDARDS

Sl. No.	Substance or Characteristics	For drinking water (IS 10500 : 2012) (Second Revision)		For fish culture (IS 13891 : 1994) (Reaffirmed 2008)	For swimming pools (IS 3328 :1993) (Reaffirmed 2008)	For Irrigation water (IS 11624 :1986) (Reaffirmed 2009)
		Acceptable limit	Permissible limit in the absence of alternate source			
1	Colour, Hazen units, Max	5	15	-	10	-
2	Odour	Agreeable	Agreeable	-	Odourless	-
3	Taste	Agreeable	Agreeable	-	Palatable	-
4	Temperature ^{o} C,range	-	-	2 to 35		-
5	Turbidity, NTU, Max	1	5	10	10	-
6	pH value	6.5 to 8.5	No relaxation	6.5 to 8.5	7.5 to 8.5	-
7	Total Hardness (as $CaCO_3$),mg/l, Max	200	600	-	-	-
8	Iron (as Fe), mg/l, Max	0.3	No relaxation	2.0 Total Iron (as Fe)	0.1	-
9	Chlorides (as Cl),mg/l, Max	250	1000	-	500	-
10	Fluoride (as F),mg/l, Max	1.0	1.5	-	-	-
11	Total Dissolved solids, mg/l, Max	500	2000	-	1500	-
12	Specific conductivity at 25 ^{o} C, µmho , Max	-	-	$1500x10^{-6}$	-	6000 µmho/ cm
13	Calcium (as Ca), mg/l, Max	75	200	-	-	-
14	Magnesium (as Mg), mg/l, Max	30	100	-	-	-
15	Sulphate (as SO_4), mg/l, Max	200	400	-	-	-
16	Nitrate (as NO_3), mg/l, Max	45	No relaxation	2.0 (as N)	-	-
17	Ammonia (as total ammonia-N), mg/l, Max	0.5	No relaxation	1.5 (As free ammonia)	-	-
18	Total alkalinity as $CaCO_3$ mg/l, Max	200	600	100 to 300 as $CaCO_3$ mg/l	50 to 500 Total alkalinity as $CaCO_3$ mg/l, Max	-
19	Aluminium (as Al), mg/l, Max	0.03	0.2	-	0.1	-
20	Boron, mg/l, Max	0.5	1.0	-	-	4.0
21	Dissolved oxygen, mg/l, Min	-	-	4.0	-	-
22	Sodium Adsorption Ratio(SAR) $\frac{}{\sqrt{\text{milli mole/l}}}$					26.0
23	Residual Sodium Carbonate(RSC) m.eq/l					6.0

TOLERANCE LIMITS OF TOXIC ELEMENTS AND PESTICIDES OF WATER QUALITY PARAMETERS FOR DRINKING WATER AS PRESCRIBED BY THE BUREAU OF INDIAN STANDARDS

Sl. No.	Substance or Characteristics	For drinking water (IS 10500 : 2012) (Second Revision)		For fish culture (IS 13891 : 1994) (Reaffirmed 2008)	For swimming pools (IS 3328 :1993) (Reaffirmed 2008)
		Acceptable limit	Permissible limit in the absence of alternate source		
a	**Toxic element**				
1	Total Arsenic (as As) mg/l, max	0.01	0.05	0.05	-
2	Cadmium (as Cd) mg/l ,max	0.03	No relaxation	0.01	-
3	Total Chromium (as Cr) mg/l ,max	0.05	No relaxation	0.05	-
4	Copper (as Cu) mg/l ,max	0.05	1.50	0.05	-
5	Mercury (as Hg) mg/l ,max	0.001	No relaxation	0.001	-
6	Nickel (as Ni) mg/l ,max	0.02	No relaxation		-
7	Lead (as Pb) mg/l ,max	0.01	No relaxation	0.05	0.1
8	Zinc (as Zn) mg/l ,max	5.0	15	0.5	-
b	**Pesticides**			Absent	-
1	Aldrin , µg/l	0.03	-		
2	Alpha- BHC/HCH, µg/l	0.01	-		
3	Beta-BHC ,µg/l	0.04	-		
4	gamma-BHC (Benzene HexaChloride) ,µg/l	2.0	-		
5	D- BHC ,µg/l	0.04	-		
6	DDT ,µg/l	1.0	-		
7	Dieldrin ,µg/l	0.03	-		
8	Endosulphan (alpha, beta and sulphate)l ,µg/l	0.4	-		

TOLERANCE LIMITS OF BACTERIOOLOGICAL PARAMETERS FOR DRINKING WATER AS PRESCRIBED BY THE BUREAU OF INDIAN STANDARDS

Sl. No.	Organisms	Requirements as per (IS 10500 : 2012) (Second Revision)
	Treated water entering the distribution system	
1	E. coli	Shall not be detectable in any 100 ml sample
2	Total coliform bacteria	Shall not be detectable in any 100 ml sample