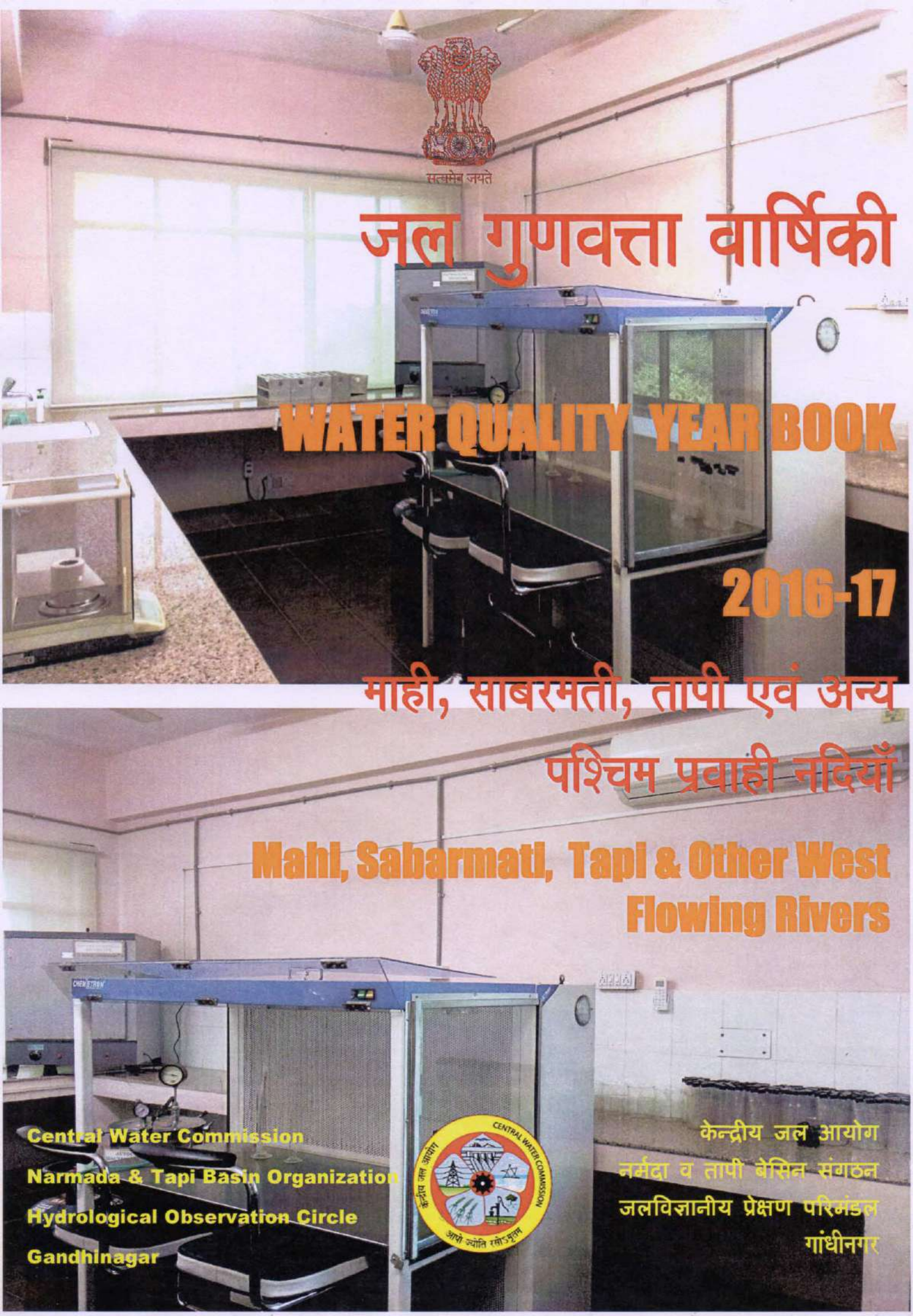

सत्यमेव जयते

जल गुणवत्ता वार्षिकी

WATER QUALITY YEAR BOOK

2016-17

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

गांधीनगर

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, गांधीनगर,नर्मदा तापी बेसिन संगठन के अन्तर्गत केन्द्रीय जल आयोग की एक क्षेत्रीय ईकाई है जिसके अन्तर्गत माही मंडल, गांधीनगर 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 निर्धारित 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 2016-17 के संकलित आंकडे इस वार्षिकी द्वारा प्रकाशित किए जा रहे हैं। शेष **2** कार्य स्थलों के आँकड़े जो नर्मदा नदी बेसिन से संबंधित हैं, उन्हे नर्मदा बेसिन संगठन, केन्द्रीय जल आयोग, भोपाल को भेज दिए जाते हैं जहाँ से उनका प्रकाशन किया जाता है। 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, गांधीनगर, माही मंण्डल, गांधीनगर एवं तापी मंण्डल, सूरत के अधिकारियों एवं कर्मचारियों ने जिस समर्पण एवं लगन से कार्य संपादित किया है, वह प्रशंसनीय है।

विमल कुमार
अधीक्षण अभियंता

नवम्बर **2017**
गांधीनगर

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 2016-17. Data of 2 sites, located in Narmada basin are sent to Narmada Basin Organisation, C.W.C. Bhopal, which publishes them separately. 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 Kumar
Superintending Engineer

November 2017
Gandhinagar

LIST OF OFFICERS

1	Shri. M.P Singh	:	Chief Engineer, NTBO, Gandhinagar
2	Shri. Vimal Kumar	:	Superintending Engineer, HOC, Gandhinagar
3	Shri. Vishnu Sharma	:	Executive Engineer, Mahi Division, Gandhinagar
4	Dr. U.P.Gupta	:	Executive Engineer, Tapi Division, Surat
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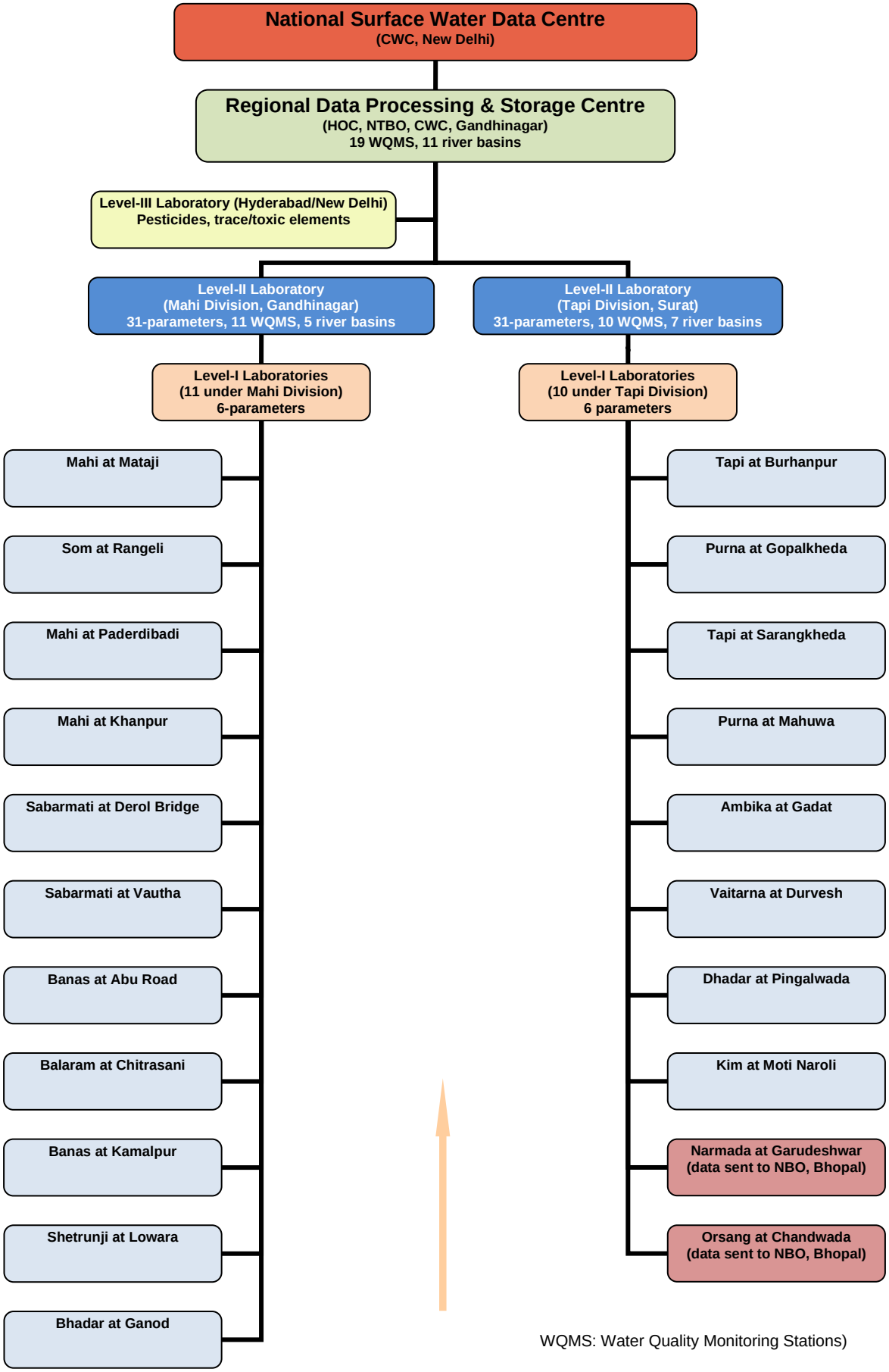
7	Shri. K. P. Gireendran	:	Assistant Research Officer, Mahi Division, Gandhinagar
8	Shri. D.K. Jawale	:	Scientific Assistant, Tapi Division, Surat

C O N T E N T S

List of Maps and Line diagrams

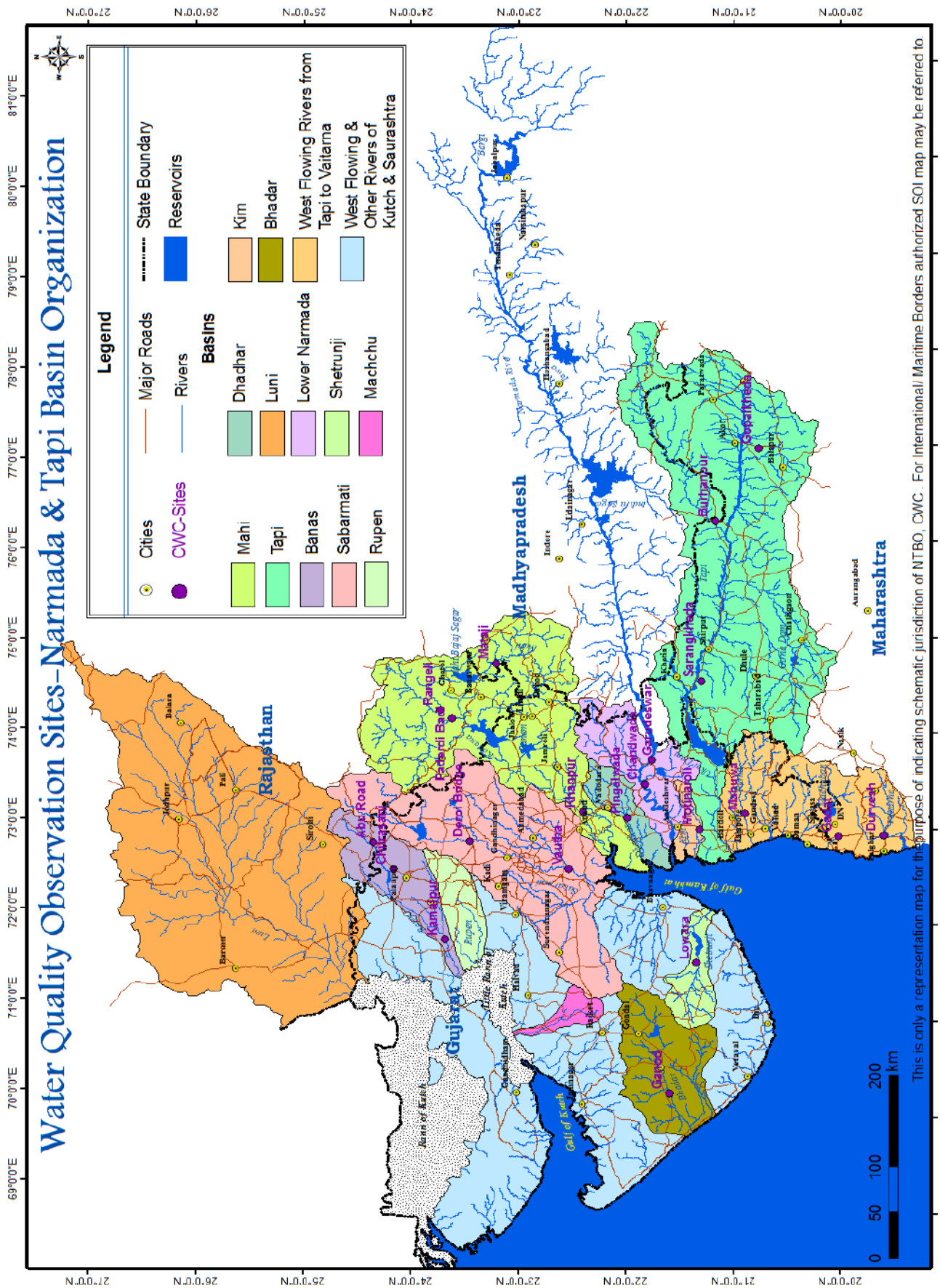
List of Annexure

Water Quality Analysis- Flow of Data

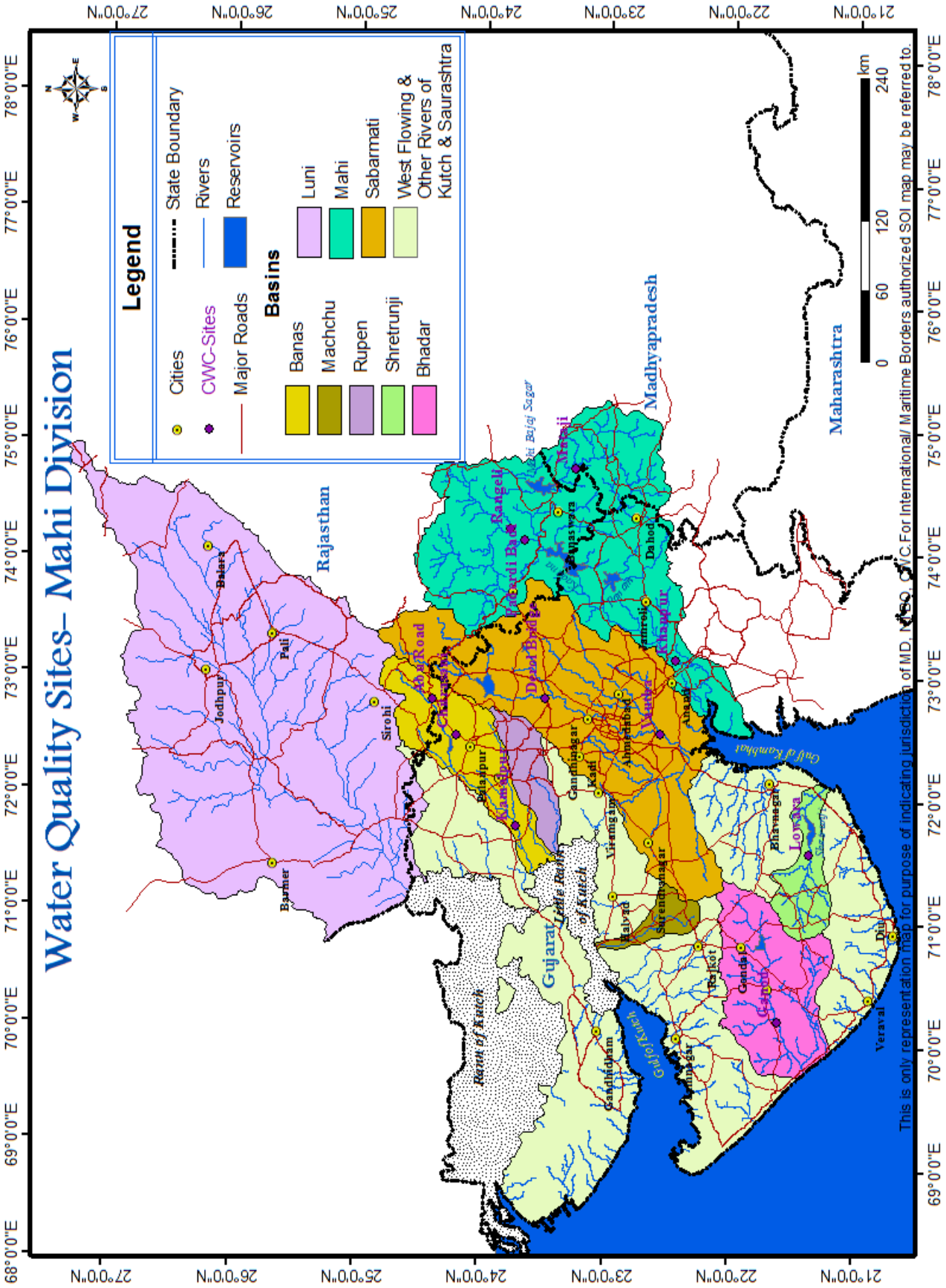


WQMS: Water Quality Monitoring Stations)

Water Quality Observation Sites under NTBO



Water Quality Observation Sites under Mahi Division



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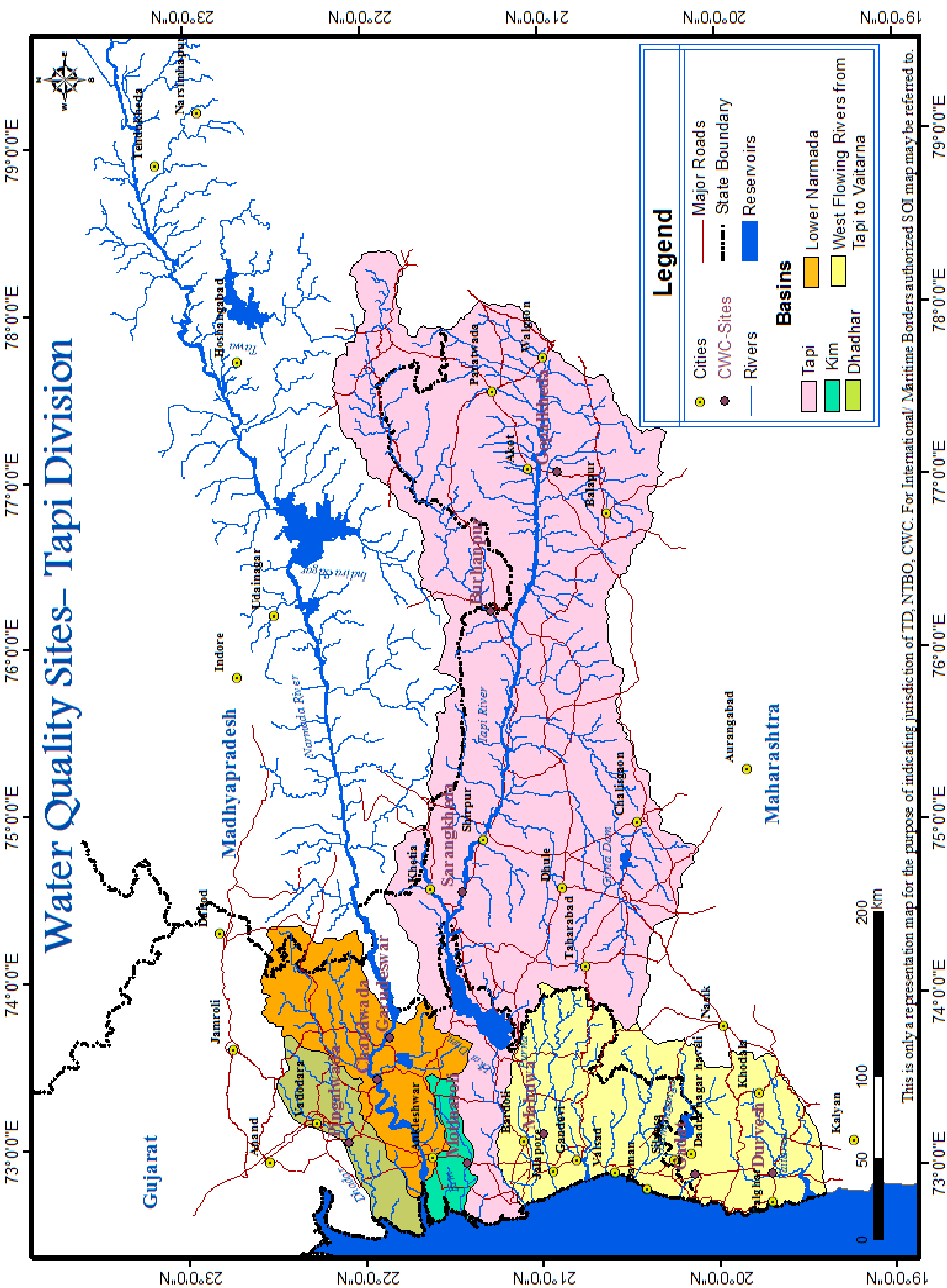

ABBREVIATIONS AND SYMBOLS

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 2016-17. 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 2016 - 17 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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2. MAHI BASIN

2.0 Mahi Basin

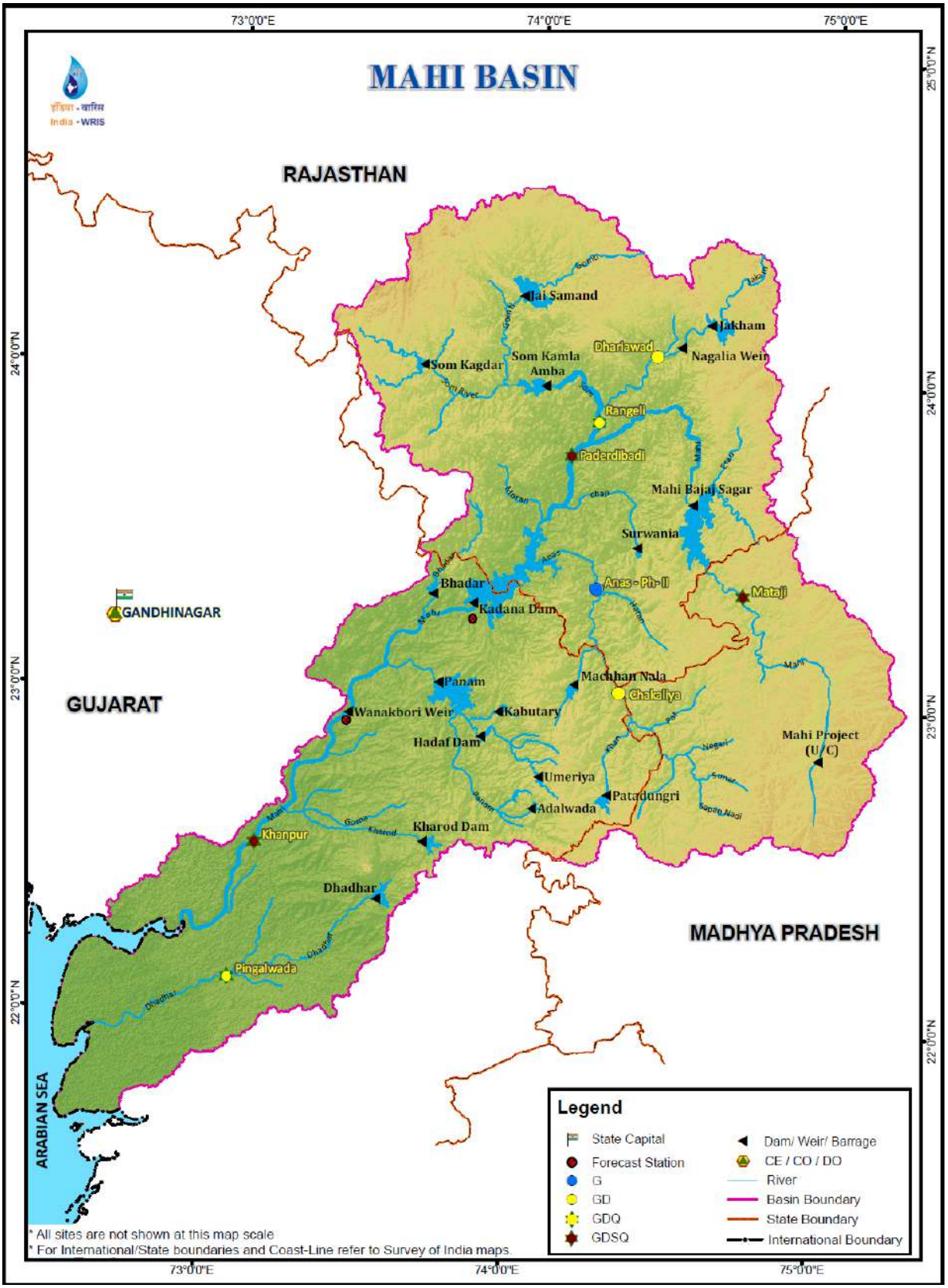
2.1 Basin description

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.

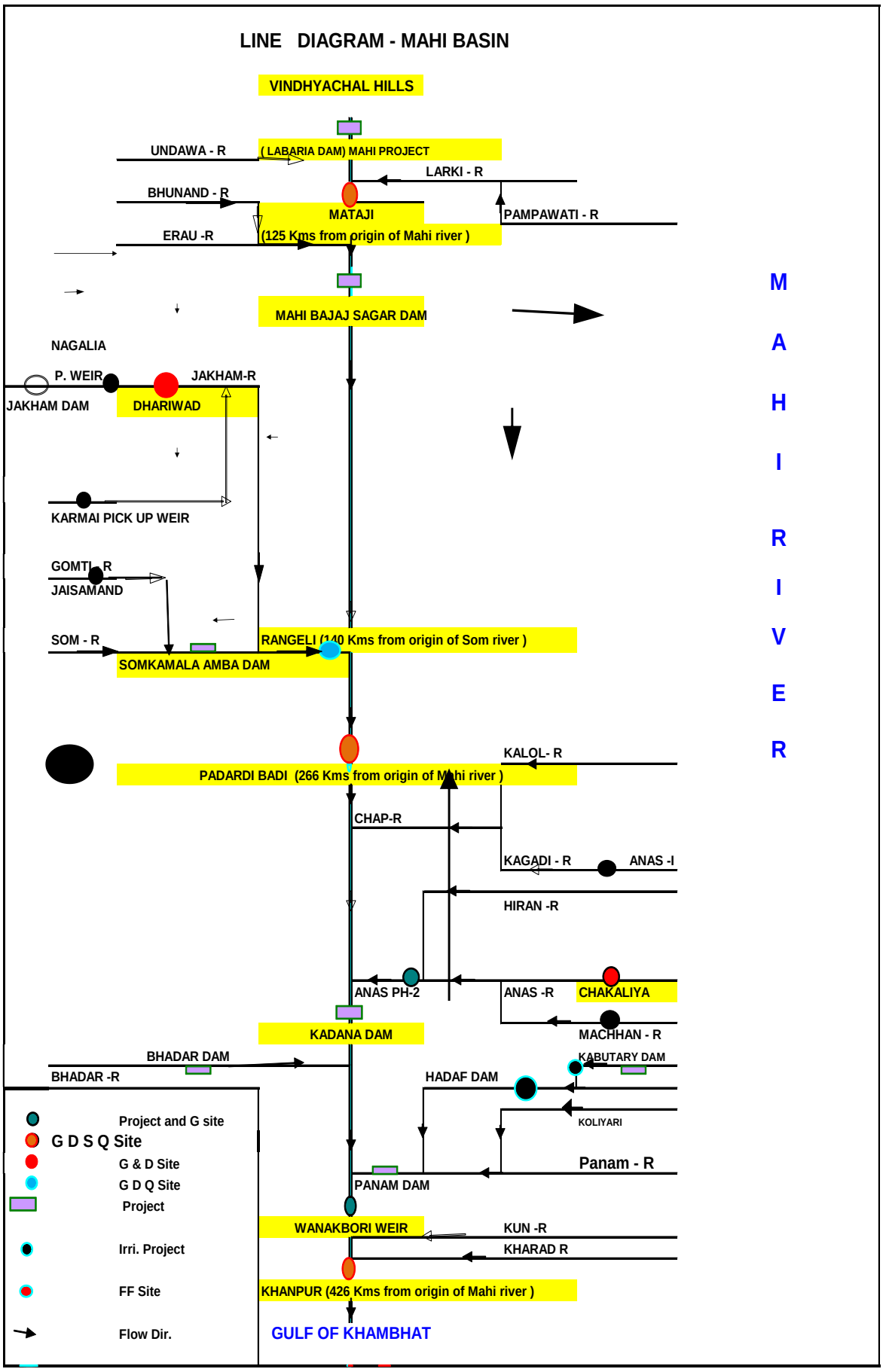
The Mahi river receives several tributaries on both banks out of which the main tributaries are Som, Anas and Panam. The Som River joins the main river on the right Bank in Rajasthan. The Anas and Panam join the main river on the left Bank in the Rajasthan & Gujarat respectively.

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
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
Anas - Ph-II
Mataji
Kadana Dam
Panam
Machhan Nala
Chakaliya
Wanakbori Weir
Kabutary
Hadaf Dam
Mahi Project (U/C)
Umeriya
Patadungri
Adalwada
Kharod Dam
Khanpur
Dhadhar
Pingalwada
73°0'0"E
74°0'0"E
75°0'0"N
24°0'0"N
23°0'0"N
22°0'0"N
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

LINE DIAGRAM - MAHI BASIN



2.2 Water Quality Data

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	227.9	648.5	298.2	5.870	0.000	0.000	2.857	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		Light Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	418		403		403		415		410		415	
4	EC_GEN (µmho/cm)	508		278		357		483		333		338	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	8.1		8.1		8.1		8.2		8.1		8.1	
7	pH_GEN (pH units)	8.2		8.4		8.2		8.5		8.5		8.4	
8	SS (mg/L)	19		113		28		26		74		70	
9	TDS (mg/L)	325		175		224		310		206		210	
10	Temp (deg C)	29.0		26.0		22.0		16.0		14.0		19.0	
11	Turb (NTU)	2.0		105.0		8.0		3.0		4.0		5.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0		5.8		0.0		11.6		11.6		10.0	
2	ALK-TOT (mgCaCO3/L)	180		92		88		151		123		124	
3	Ca (mg/L)	63		38		33		54		43		45	
4	Cl (mg/L)	54.0	O	20.0	O	26.0	O	70.0	O	36.0	O	38.0	O
5	CO3 (mg/L)	0.0	N	7.0	N	0.0	N	14.0	N	14.0	N	12.0	N
6	F (mg/L)	0.56	C	0.44	C	0.44	C	0.57	C	0.61	C	0.64	C
7	Fe (mg/L)	0.4	E	0.3	E	0.3	E	0.3	E	0.3	E	0.3	E
8	HCO3 (mg/L)	220		98		107		156		122		127	
9	K (mg/L)	1.1		0.8		0.9		2.7		1.6		2.8	
10	Mg (mg/L)	13.1	I	8.5	I	11.2	I	11.9	I	13.4	I	13.4	I
11	Na (mg/L)	38.3	N	13.3	N	19.6	N	50.8	N	24.3	N	27.3	N
12	NH3-N (mg N/L)	0.05		0.13		0.60		0.75		1.05		0.61	
13	NO2+NO3 (mg N/L)	0.49	2	4.93	2	6.39	2	5.85	2	4.85	2	5.13	2
14	NO2-N (mgN/L)	0.01		0.03		0.02		0.06		0.09		0.28	
15	NO3-N (mgN/L)	0.48	M	4.90	M	6.37	M	5.79	M	4.76	M	4.85	M
16	P-Tot (mgP/L)	0.070	O	0.050	O	0.060	O	0.070	O	0.030	O	0.040	O
17	SiO2 (mg/L)	43.1	N	26.9	N	36.6	N	49.6	N	36.6	N	54.8	N
18	SO4 (mg/L)	18.8	T	15.0	T	16.0	T	16.4	T	14.3	T	14.5	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)	4.5		1.9		3.2		2.2		2.5		2.0	
2	COD (mg/L)	26.0		8.0		8.0		11.0		13.0		18.0	
3	DO (mg/L)	4.6		5.9		7.0		8.0		8.1		4.8	
4	DO_SAT% (%)	59		72		81		81		79		51	
5	FCol-MPN (MPN/100mL)	1300		130		1100		78		45		78	
6	Tcol-MPN (MPN/100mL)	2400		2800		1700		330		68		130	
	TRACE & TOXIC												
1	Al (mg/L)	0.04		0.03		0.04		0.05		0.04		0.04	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	158		95		82		135		108		112	
2	HAR_Total (mgCaCO3/L)	213		131		129		185		164		168	
3	Na% (%)	28		18		25		37		24		26	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	1.1		0.5		0.8		1.6		0.8		0.9	
	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			Date of sampling																										
a	Trace and Toxic	Parameter Name	unit	**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**	**01.08.2016**	**01.12.2016**	**01.04.2017**	**01.04.2017**
				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	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
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	0.25	1.17	2.00	0.485
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	0.12	0.13	0.00	0.00
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	0.80	1.32	3.00	0.00
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	6.17	11.73	2.00	5.30
5	Hg	Mercury	microgram / l	-	6.021	0			-	3.49				-	0.26	0.171	BDl	0.086	-	-	-	0.07	-	-	0.21	-	-	-	-	0.027
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	0.28	4.98	48.0	0.00
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	1.64	0.9	1.00	0.00
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	0.28	2.50	18.0	5.13
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	-	-	Pesticides value not reported .	-	Pesticides value not reported .	-	-	-	-	-	-	-	-	-	-	-	-
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	-			-	-				-	-		-		-	-	-	-	-	-	-	-	-	-	-	-

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 : 2016-2017

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	4057	0.000	98.57
2	EC_FLD (µmho/cm)	6	418	403	411
3	EC_GEN (µmho/cm)	6	508	278	383
4	pH_FLD (pH units)	6	8.2	8.1	8.1
5	pH_GEN (pH units)	6	8.5	8.2	8.4
6	SS (mg/L)	6	113	19	55
7	TDS (mg/L)	6	325	175	242
8	Temp (deg C)	6	29.0	14.0	21
9	Turb (NTU)	6	105.0	2.0	21.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	11.6	0.0	6.5
2	ALK-TOT (mgCaCO3/L)	6	180	88	126
3	Ca (mg/L)	6	63	33	46
4	Cl (mg/L)	6	70.0	20.0	40.7
5	CO3 (mg/L)	6	14.0	0.0	7.8
6	F (mg/L)	6	0.64	0.44	0.54
7	Fe (mg/L)	6	0.4	0.3	0.3
8	HCO3 (mg/L)	6	220	98	138
9	K (mg/L)	6	2.8	0.8	1.6
10	Mg (mg/L)	6	13.4	8.5	11.9
11	Na (mg/L)	6	50.8	13.3	28.9
12	NH3-N (mg N/L)	6	1.05	0.05	0.53
13	NO2+NO3 (mg N/L)	6	6.39	0.49	4.61
14	NO2-N (mgN/L)	6	0.28	0.01	0.08
15	NO3-N (mgN/L)	6	6.37	0.48	4.53
16	P-Tot (mgP/L)	6	0.070	0.030	0.053
17	SiO2 (mg/L)	6	54.8	26.9	41.2
18	SO4 (mg/L)	6	18.8	14.3	15.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	4.5	1.9	2.7
2	COD (mg/L)	6	26.0	8.0	14
3	DO (mg/L)	6	8.1	4.6	6.4
4	DO_SAT% (%)	6	81	51	71
5	FCol-MPN (MPN/100mL)	6	1300	45	455
6	Tcol-MPN (MPN/100mL)	6	2800	68	1238
	TRACE & TOXIC				
1	Al (mg/L)	6	0.05	0.03	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	158	82	115
2	HAR_Total (mgCaCO3/L)	6	213	129	165
3	Na% (%)	6	37	18	26
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	1.6	0.5	1
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Mahi | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	234.9	0.431	1.975	2.220	0.591	1.619	1.785	0.772	1.565	42.00	1.810	0.000	2.182	0.030	0.406	0.419	0.045	0.000	0.163	0.000	0.197	0.887	2.409	0.000	0.000
2	EC_FLD (µmho/cm)	246	334	360	321	333	326	382	407	408	421	406	408	350	414	385	392	395	461	434	496	419	418	410	413	306	364	298			334		361	411	402	410	415
3	EC_GEN (µmho/cm)	245	333	347	319	310	329	347	334	331	373	362	381	310	399	369	378	379	401	488	414	387	346	383	408	295	359	299			307		359	309	312	384	338
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	8.1	7.8	7.2	7.6	7.9	8.0	8.3	7.1	7.2	8.1	8.1	8.0	8.1	7.9	6.9	7.7			8.2		7.9	8.0	8.1	8.0	8.1
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	8.3	8.2	8.1	8.2	7.7	8.3	8.3	8.3	8.2	8.5	8.1	8.1	8.5			7.5		8.4	8.2	8.5	7.9	8.4
6	SS (mg/L)	23	74	34	22	25	57	57	63	61	74	67	53	17	20	19	28	20	23	84	47	39	76	21	50	22	26	12			26		51	38	70	20	70
7	TDS (mg/L)	171	248	227	205	199	208	219	214	211	237	233	241	203	239	233	245	242	254	314	264	238	224	239	258	194	228	194			199		221	204	190	246	210
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	25.7	22.1	24.1	20.4	24.4	24.4	25.1	27.1	19.4	21.0	18.5	20.5	15.0	27.0	28.0	29.0			27.5		23.7	23.0	23.0	24.0	19.0
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	38.3	3.0	6.0	3.0	1.5	1.0	4.5	4.0	4.5	2.5	2.5	1.5	3.5	2.0	4.0	1.0			6.0		4.7	6.0		7.0	5.0
	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	1.9	1.2	1.7	2.1	0.0	0.0	0.4	0.0	0.8	4.2	2.1	5.8	11.6	0.0	0.0	1.7			0.0		1.1	0.0	5.8	0.0	10.0
2	ALK-TOT (mgCaCO3/L)	124	160	151	178	98	112	113	116	123	125	113	120	182	171	124	204	116	126	152	152	140	132	122	137	180	189	148			98		146	116	88	140	124
3	Ca (mg/L)	28	29	31	31	37	40	41	43	44	43	39	45	32	30	30	33	40	44	59	57	53	46	50	49	32	30	26			34		50	45	30	47	45
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	33.3	25.0	29.0	29.0	25.0	36.0	39.5	32.0	39.5	30.0	20.0	26.0	53.0	26.0	36.0	22.0			29.0		32.0	26.0	22.0	30.0	38.0
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	2.3	1.5	2.0	2.5	0.0	0.0	0.5	0.0	1.0	5.0	2.5	7.0	14.0	0.0	0.0	2.0			0.0		1.3	0.0	7.0	0.0	12.0
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	0.48	0.19	0.51	0.30	0.56	0.41	0.42	0.33	0.41	0.50	0.44	0.47	0.59	0.22	0.40	0.31			0.43		0.47	0.43	0.41	0.80	0.64
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	0.3	0.0	0.0	0.1	0.5	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.0	0.0	0.0			0.2		0.3	0.3	0.4	0.3	0.3
8	HCO3 (mg/L)	97	98	128	107	116	137	138	142	150	140	125	142	110	103	100	125	142	153	185	184	161	157	134	139	110	115	88			120		176	142	93	171	127
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	0.9	1.0	0.8	0.4	1.4	1.1	1.3	0.7	0.9	0.9	0.7	0.8	2.1	1.0	0.4	0.9			0.9		0.7	0.8	0.7	0.9	2.8
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	10.9	7.3	4.6	7.8	8.8	11.7	9.7	7.8	10.0	10.2	13.6	9.0	12.6	7.8	7.3	5.8			8.3		9.7	10.7	9.7	12.1	13.4
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	23.7	15.0	21.0	20.5	18.0	24.0	29.3	23.7	27.4	22.7	13.8	18.5	37.5	16.0	28.0	16.0			21.5		22.0	19.5	13.3	21.6	27.3
12	NH3-N (mg N/L)			0.06	0.72	0.28	0.26	0.16	0.48	0.25	0.52	0.36	0.26			0.05	0.24	0.07	0.09	0.05	0.10	0.29	0.07	0.24	0.90			0.14			0.07		0.16	0.37	0.08	0.07	0.61
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	3.94	0.12	0.17	1.46	1.81	4.16	1.88	6.39	5.57	5.29	4.13	4.66	5.35	0.03	0.33	0.68			1.43		2.24	5.11	0.36	0.55	5.13
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	0.02	0.01	0.01	0.05	0.03	0.03	0.02	0.01	0.02	0.03	0.01	0.03	0.08	0.00	0.01	0.01			0.01		0.02	0.05	0.01	0.06	0.28
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	3.92	0.11	0.16	1.42	1.78	4.13	1.86	6.38	5.54	5.25	4.11	4.63	5.28	0.03	0.32	0.67			1.41		2.22	5.06	0.35	0.49	4.85
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	0.060	0.030	0.015	0.025	0.055	0.100	0.060	0.070	0.072	0.055	0.075	0.065	0.050	0.020	0.010	0.020			0.060		0.080	0.050	0.070	0.060	0.040
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	35.5	17.8	16.4	27.4	33.8	36.2	31.5	60.1	39.2	41.5	35.4	39.6	43.1	17.6	22.5	24.6			34.0		38.7	37.1	33.7	38.3	54.8
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	16.6	10.0	11.3	14.0	7.7	12.1	19.2	9.1	9.8	9.9	15.9	16.2	15.4	10.2	12.4	12.4			18.1		9.5	9.9	15.1	15.8	14.5
	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	3.2	0.4	1.4	1.7	2.0	1.3	1.6	2.8	1.6	2.6	1.6	3.0	2.3	0.4	1.4	2.9			2.6		1.9	2.6	3.3	4.2	2.0
2	COD (mg/L)										89.5	49.1	14.0									131.3	19.4	13.0	12.0								24.3	8.0	8.0	18.0
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	5.8	9.1	9.8	9.2	9.9	8.4	9.1	10.9	10.6	10.0	9.0	7.4	8.1	7.2	8.2	9.5			8.5		7.7	8.4	8.3	5.4	4.8
4	DO_SAT% (%)	86	91	91	95	106	95	98	98	91	86	80	71	104	116	101	118	100	108	137	115	112	97	82	80	90	105	124			106		91	98	96	64	51
5	FCol-MPN (MPN/100mL)										3533	5917	843									56	2700	158	62									1700	2	20	78
6	Tcol-MPN (MPN/100mL)										26900	30567	2300									17252	15550	199	199									14800	70	70	130
	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	0.04	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.04	0.01	0.01	0.01			0.02		0.03	0.04	0.04	0.03	0.04
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	71	72	78	77	92	99	102	107	111	108	98	112	80	76	76	82	100	109	148	141	132	116	126	122	80	74	64			84		126	112	76	118	112
2	HAR_Total (mgCaCO3/L)	89	93	131	105	123	131	134	143	155	155	147	157	111	95	109	119	149	150	181	183	175	173	163	174	113	105	88			119		166	157	117	169	168
3	Na% (%)	21	25	25	26	25	26	20	19	14	19	18	24	23	32	29	25	26	30	22	24	22	15	20	31	23	37	28			28		22	21	20	22	26
4	SAR (-)	0.5	0.7	0.8	0.7	0.8	0.9	0.6	0.6	0.4	0.6	0.5	0.8	0.6	0.9	0.9	0.7	0.9	1.0	0.8	0.9	0.7	0.5	0.6	1.2	0.7	1.2	0.7			0.9		0.7	0.7	0.5	0.7	0.9
	PESTICIDES																																				

POOLING CONDITION / SNR

POOLING CONDITION

POOLING CONDITION / SNR

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	97.72	43.88	34.88	11.56	11.12	11.21	11.35	6.698	6.463	0.000
2	Colour_Cod (-)	Clear		Light Brown		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	575		450		620		610		570		585	
4	EC_GEN (µmho/cm)	491		361		502		534		529		545	
5	Odour_Code (-)	odour free		odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	7.9		7.7		7.9		7.8		7.5		7.8	
7	pH_GEN (pH units)	8.8		8.6		8.3		8.7		8.4		8.4	
8	SS (mg/L)	11		38		26		24		64		61	
9	TDS (mg/L)	310		236		328		342		342		345	
10	Temp (deg C)	24.0		25.0		26.0		24.0		24.0		24.0	
11	Turb (NTU)	3.0		47.0		1.0		1.0		1.0		3.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	8.3		11.6		8.3		15.8		8.3		8.3	
2	ALK-TOT (mgCaCO3/L)	172		127		145		172		165		172	
3	Ca (mg/L)	67		49		43		59		57		61	
4	Cl (mg/L)	52.0	O	28.0	O	42.0	O	58.0	O	54.0	O	60.0	O
5	CO3 (mg/L)	10.0	N	14.0	N	10.0	N	19.0	N	10.0	N	10.0	N
6	F (mg/L)	0.57	C	0.81	C	0.43	C	0.62	C	0.64	C	0.65	C
7	Fe (mg/L)	0.4	E	0.3	E	0.4	E	0.4	E	0.3	E	0.4	E
8	HCO3 (mg/L)	190		127		156		171		181		190	
9	K (mg/L)	1.3		1.0		1.3		3.1		2.8		2.4	
10	Mg (mg/L)	12.2	I	10.7	I	16.5	I	13.6	I	14.8	I	16.3	I
11	Na (mg/L)	34.1	N	21.6	N	30.0	N	44.1	N	38.8	N	42.6	N
12	NH3-N (mg N/L)	0.26		0.35		0.90		0.65		0.92		2.41	
13	NO2+NO3 (mg N/L)	1.41	2	2.19	2	0.91	2	2.70	2	2.77	2	2.63	2
14	NO2-N (mgN/L)	0.03		0.01		0.01		0.04		0.04		0.08	
15	NO3-N (mgN/L)	1.38	M	2.18	M	0.90	M	2.66	M	2.73	M	2.55	M
16	P-Tot (mgP/L)	0.110	O	0.090	O	0.100	O	0.100	O	0.100	O	0.100	O
17	SiO2 (mg/L)	43.1	N	18.5	N	18.2	N	38.3	N	37.8	N	42.2	N
18	SO4 (mg/L)	31.5	T	32.5	T	32.7	T	33.3	T	32.9	T	33.9	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)	3.4		2.3		1.6		2.2		2.0		4.3	
2	COD (mg/L)	25.0		9.0		2.0		6.0		10.0		10.0	
3	DO (mg/L)	3.4		6.4		6.2		7.8		8.1		8.8	
4	DO_SAT% (%)	41		77		77		93		96		105	
5	FCol-MPN (MPN/100mL)	170		220		20		20		130		20	
6	Tcol-MPN (MPN/100mL)	330		1700		68		140		330		130	
	TRACE & TOXIC												
1	Al (mg/L)	0.05		0.04		0.05		0.04		0.05		0.05	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	166		123		107		148		143		151	
2	HAR_Total (mgCaCO3/L)	217		168		176		205		205		219	
3	Na% (%)	25		22		27		32		29		30	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	1.0		0.7		1.0		1.3		1.2		1.3	
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	0.18	1.90	6.00	3.746
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	0.11	0.01	0.00	0.20
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	0.09	1.12	2.00	0.00
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	6.01	9.31	1.00	6.50
5	Hg	Mercury	microgram / l	-	2.252	0			-	0.58	-	0	-	-	0.27	0.132	BDL	0.116	-	-	-	0.085	-	-	0.11	-	-	-	-	0.068
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	1.17	3.9	69.0	1.40
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	0.30	0.83	125.0	0.00
8	Zn	Zinc	microgram / l	0	27.00	10.50	R I V E R D R Y	R I V E R D R Y	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	1.17	4.20	27.0	8.45
b	Pesticides		microgram / l																											
1	Aldrin	Aldrin	microgram / l	0	0.01	0			0	-	-	0.0015	-	-	-	Pesticides value not reported .	-	Pesticides value not reported .	-	-	-	-	-	-	-	-	-	-	-	-	-
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	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-

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 : 2016-2017

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	598.5	0.000	31.53
2	EC_FLD (µmho/cm)	6	620	450	568
3	EC_GEN (µmho/cm)	6	545	361	494
4	pH_FLD (pH units)	6	7.9	7.5	7.8
5	pH_GEN (pH units)	6	8.8	8.3	8.5
6	SS (mg/L)	6	64	11	37
7	TDS (mg/L)	6	345	236	317
8	Temp (deg C)	6	26.0	24.0	24.5
9	Turb (NTU)	6	47.0	1.0	9.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	15.8	8.3	10.1
2	ALK-TOT (mgCaCO3/L)	6	172	127	159
3	Ca (mg/L)	6	67	43	56
4	Cl (mg/L)	6	60.0	28.0	49
5	CO3 (mg/L)	6	19.0	10.0	12.2
6	F (mg/L)	6	0.81	0.43	0.62
7	Fe (mg/L)	6	0.4	0.3	0.4
8	HCO3 (mg/L)	6	190	127	169
9	K (mg/L)	6	3.1	1.0	2
10	Mg (mg/L)	6	16.5	10.7	14
11	Na (mg/L)	6	44.1	21.6	35.2
12	NH3-N (mg N/L)	6	2.41	0.26	0.92
13	NO2+NO3 (mg N/L)	6	2.77	0.91	2.1
14	NO2-N (mgN/L)	6	0.08	0.01	0.03
15	NO3-N (mgN/L)	6	2.73	0.90	2.07
16	P-Tot (mgP/L)	6	0.110	0.090	0.1
17	SiO2 (mg/L)	6	43.1	18.2	33
18	SO4 (mg/L)	6	33.9	31.5	32.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	4.3	1.6	2.6
2	COD (mg/L)	6	25.0	2.0	10.3
3	DO (mg/L)	6	8.8	3.4	6.8
4	DO_SAT% (%)	6	105	41	81
5	FCol-MPN (MPN/100mL)	6	220	20	97
6	Tcol-MPN (MPN/100mL)	6	1700	68	450
	TRACE & TOXIC				
1	Al (mg/L)	6	0.05	0.04	0.05
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	166	107	140
2	HAR_Total (mgCaCO3/L)	6	219	168	198
3	Na% (%)	6	32	22	27
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	1.3	0.7	1.1
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	35.30	3.060	7.012	3.267	2.428	4.846	5.552	13.75	4.847	37.85	8.194	8.584	11.31	1.462	1.847	2.454	0.228	0.541	2.121	3.730	2.607	5.999	5.086	5.274	4.387
2	EC_FLD (µmho/cm)									545	547	548	548								575	630	590	595	590								585	585	585	585	585
3	EC_GEN (µmho/cm)	508	261	639	456	498	439	453	520	648	523	535	451	493	538	513		569	590	535	572	550	545	479	532	493	623	593			755	486	563	592	587	429	545
4	pH_FLD (pH units)									8.2	7.8	7.8	7.8				O				7.4	9.3	7.6	7.7	7.7				O	O			7.8	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	8.6	8.2	8.3	8.5	N	8.2	8.2	8.0	8.2	8.5	8.3	8.2	8.5	8.0	8.5	8.5	N	N	7.3	8.1	8.5	8.4	8.7	8.4	8.4
6	SS (mg/L)	43	103	32	20	39	35	44	42	43	71	99	25	18	45	34	C	50	51	39	43	31	63	37	44	20	20	10	C	C	50	48	34	22	76	26	61
7	TDS (mg/L)	335	207	411	302	327	281	291	342	431	335	338	291	302	343	333	E	353	374	334	366	346	345	302	342	338	416	360	E	E	482	304	360	382	364	278	345
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	25.0	24.5	18.0	21.5		21.0	23.5	20.0	17.5	21.0	19.5	23.5	24.0	23.0	21.0	26.0			28.0	26.0	20.8	20.0	24.0	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	17.0	9.0	14.0	3.0		1.0	4.5	3.0	4.5	2.0	2.5	1.0	1.0	8.0	6.0	2.0			2.0	1.0	3.0	4.0		4.0	3.0
	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	9.4	0.0	1.7	7.1	N	0.8	0.8	0.0	0.0	13.7	5.0	0.0	12.0	0.0	5.0	4.2	N	N	0.0	0.0	1.7	5.8	14.1	10.0	8.3
2	ALK-TOT (mgCaCO3/L)	200	158	284	213	158	144	144	158	180	166	146	148	225	270	254		182	186	162	194	189	178	146	168	236	310	281			208	160	235	184	184	156	172
3	Ca (mg/L)	33	27	40	37	51	48	51	56	48	53	45	53	35	35	46	2	57	63	59	70	65	58	59	58	39	42	37	2	2	77	55	83	69	61	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	40.7	40.0	73.5	56.0		69.0	72.0	41.0	50.0	45.0	44.0	37.0	56.0	42.0	80.0	60.0			92.0	40.0	60.0	48.0	54.0	36.0	60.0
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	11.3	0.0	2.0	8.5	M	1.0	1.0	0.0	0.0	16.5	6.0	0.0	14.5	0.0	6.0	5.0	M	M	0.0	0.0	2.0	7.0	17.0	12.0	10.0
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	0.60	0.67	0.67	0.48	O	0.61	0.61	0.63	0.90	0.87	0.85	0.66	0.63	0.66	0.78	0.42	O	O	0.86	0.65	0.91	0.75	0.83	0.80	0.65
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	0.4	0.0	0.0	0.1	N	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.0	0.0	0.1	N	N	0.5	0.4	0.5	0.5	0.5	0.4	0.3
8	HCO3 (mg/L)	121	97	171	125	193	176	176	193	216	184	156	158	137	163	147	T	220	225	198	237	198	205	178	176	144	183	166	T	T	254	195	283	210	190	166	190
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	1.2	2.0	1.1	0.8	H	0.9	2.2	0.8	0.9	0.9	0.7	1.0	3.0	1.0	1.1	1.7	H	H	1.7	0.8	1.0	1.0	0.9	1.2	2.4
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	13.1	9.3	13.1	9.2	/	13.1	11.2	11.7	10.7	11.7	19.2	8.8	14.2	8.7	13.6	17.5	/	/	11.7	11.7	10.7	11.7	19.2	8.8	16.3
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	28.6	29.0	57.0	42.5		50.8	51.7	28.4	34.6	34.6	28.9	28.4	41.4	30.0	62.0	45.4			60.8	26.8	40.3	37.2	32.0	27.9	42.6
12	NH3-N (mg N/L)			0.06	0.75	0.44	0.11	0.17	0.45	0.64	0.55	0.24	0.50	0.06		0.06		0.08	0.15	0.23	0.23	0.36	0.15	0.15	0.78			0.10			0.38	0.38	0.38	0.61	0.45	0.44	2.41
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	1.50	0.03	1.04	0.91	P	0.44	0.28	1.89	1.76	2.59	1.02	1.58	2.74	0.03	1.02	1.99	P	P	1.06	1.80	1.10	2.58	0.23	1.43	2.63
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	0.02	0.00	0.01	0.04	O	0.01	0.01	0.01	0.03	0.01	0.01	0.08	0.04	0.00	0.02	0.01	O	O	0.01	0.02	0.03	0.02	0.01	0.06	0.08
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	1.49	0.03	1.03	0.87	O	0.43	0.26	1.88	1.74	2.58	1.01	1.50	2.70	0.03	1.00	1.98	O	O	1.05	1.78	1.07	2.56	0.22	1.37	2.55
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	0.100	0.030	0.035	0.010	L	0.095	0.070	0.095	0.095	0.085	0.090	0.100	0.100	0.040	0.040	0.010	L	L	0.070	0.090	0.100	0.080	0.100	0.110	0.100
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	26.6	19.4	24.2	21.7	I	23.3	27.8	21.3	26.0	23.0	20.8	21.4	38.1	22.0	28.4	20.8	I	I	17.0	8.9	18.6	25.6	24.7	29.0	42.2
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	32.2	15.6	20.4	25.5	N	13.7	24.6	15.8	8.8	15.8	19.3	32.6	33.1	15.9	20.5	25.0	N	N	25.8	16.4	10.5	15.8	19.7	33.3	33.9
	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	2.4	0.8	1.6	0.9		0.4	1.6	1.2	1.2	2.4	2.7	1.5	2.1	0.5	2.6	3.0			1.6	3.6	2.0	3.2	2.8	2.2	4.3
2	COD (mg/L)										55.2	50.7	12.0									134.1	29.6	18.0	8.0								38.7	9.0	10.0	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	5.4	8.4	10.0	11.4	C	8.7	8.6	9.2	9.3	9.7	8.0	6.9	7.9	6.5	9.1	9.6	C	C	6.1	7.8	8.1	7.1	6.2	7.7	8.8
4	DO_SAT% (%)	72	76	96	101	107	79	93	91	100	65	80	65	101	105	127	O	98	101	101	97	109	87	81	94	76	102	118	O	O	78	96	89	78	73	91	105
5	FCol-MPN (MPN/100mL)										2647	1583	137				N					51	3320	94	75				N	N				2	2	20	20
6	Tcol-MPN (MPN/100mL)										20867	28583	699				D					13907	27550	206	235				D	D				94	76	80	130
	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	0.05	0.01	0.02	0.02	T	0.02	0.01	0.03	0.05	0.03	0.04	0.04	0.04	0.01	0.02	0.03	T	T	0.02	0.03	0.07	0.03	0.06	0.04	0.05
	CHEMICAL INDICES																I												I	I						
1	HAR_Ca (mgCaCO3/L)	82	68	99	92	126	120	127	140	119	134	114	132	87	87	116	O	142	156	146	174	162	145	148	146	97	106	92	O	O	192	136	208	172	153	152	151
2	HAR_Total (mgCaCO3/L)	110	96	164	127	169	161	166	183	200	190	195	187	126	142	155	N	197	203	195	219	211	225	185	205	133	163	165	N	N	241	185	253	221	233	189	219
3	Na% (%)	34	25	39	36	38	28	25	26	34	23	26	25	33	47	37		36	35	24	26	26	22	25	30	33	45	37			35	24	26	27	23	24	30
4	SAR (-)	1.1	0.7	1.7	1.3	1.6	1.1	0.9	1.0	1.7	0.9	1.0	0.9	1.1	2.1	1.5		1.6	1.6	0.9	1.0	1.0	0.8	0.9	1.3	1.1	2.1	1.5			1.7	0.9	1.1	1.1	0.9	0.9	1.3
	PESTICIDES																																				

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	182.4	438.2	78.30	19.09	15.59	17.62	17.76	14.19	11.75	10.23
2	Colour_Cod (-)	Clear	Clear	Light Brown	Light Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	545	502	590	548	547	586	570	530	585	565	515	593
4	EC_GEN (µmho/cm)	447	490	343	482	463	534	472	478	470	484	423	372
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)	8.0	7.6	7.5	7.7	7.3	7.7	7.6	7.4	8.1	8.3	8.0	7.9
7	pH_GEN (pH units)	8.6	8.4	8.6	8.1	8.3	8.3	8.7	8.2	8.4	8.4	8.7	8.8
8	SS (mg/L)	15	26	32	7	30	32	26	9	33	34	44	40
9	TDS (mg/L)	285	310	220	304	292	346	296	306	300	307	269	234
10	Temp (deg C)	32.0	28.5	28.0	27.0	29.0	25.0	23.0	20.0	18.0	22.0	26.0	27.0
11	Turb (NTU)	4.0	1.0	46.0	27.0	1.0	6.0	2.0	4.0	3.0	4.0	3.0	1.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	14.1	4.2	10.0	0.0	10.0	5.8	14.1	0.0	11.6	8.3	14.1	10.0
2	ALK-TOT (mgCaCO3/L)	173	157	124	124	136	135	156	152	147	165	141	144
3	Ca (mg/L)	69	61	48	50	36	53	51	57	50	53	50	51
4	Cl (mg/L)	44.0	44.0	20.0	46.0	40.0	48.0	46.0	54.0	44.0	48.0	36.0	32.0
5	CO3 (mg/L)	17.0	5.0	12.0	0.0	12.0	7.0	17.0	0.0	14.0	10.0	17.0	12.0
6	F (mg/L)	0.56	0.57	0.46	0.53	0.42	0.80	0.53	0.73	0.55	0.59	0.53	0.75
7	Fe (mg/L)	0.4	0.4	0.3	0.5	0.3	0.4	0.2	0.3	0.2	0.3	0.2	0.2
8	HCO3 (mg/L)	176	181	127	151	142	151	156	185	151	181	137	151
9	K (mg/L)	2.3	1.8	1.8	0.9	1.7	1.8	3.6	2.6	2.5	2.2	1.6	2.5
10	Mg (mg/L)	13.6	12.2	14.1	10.5	19.4	15.6	15.6	10.2	16.0	15.6	12.9	12.6
11	Na (mg/L)	28.9	34.1	15.4	30.0	25.8	32.0	31.5	40.3	29.1	36.6	27.7	23.3
12	NH3-N (mg N/L)	0.07	0.13	0.36	0.15	0.48	0.65	0.92	0.15	1.11	1.15	0.61	0.46
13	NO2+NO3 (mg N/L)	1.44	0.83	2.80	1.70	1.85	7.50	3.92	1.31	3.97	4.04	3.68	3.63
14	NO2-N (mgN/L)	0.04	0.01	0.01	0.02	0.02	0.05	0.05	0.03	0.03	0.03	0.03	0.03
15	NO3-N (mgN/L)	1.40	0.82	2.79	1.68	1.83	7.45	3.87	1.28	3.94	4.01	3.65	3.60
16	P-Tot (mgP/L)	0.090	0.100	0.070	0.110	0.070	0.070	0.060	0.060	0.050	0.060	0.040	0.050
17	SiO2 (mg/L)	36.9	19.9	17.4	19.2	23.1	36.4	42.3	11.3	42.0	42.7	56.3	43.3
18	SO4 (mg/L)	43.4	44.4	41.0	30.3	19.8	20.5	21.0	21.5	21.0	21.4	20.1	18.6
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	1.7	3.6	3.6	3.7	2.7	2.7	2.5	2.2	2.5	3.8	1.9	4.2
2	COD (mg/L)	17.0	19.0	13.0	6.0	8.0	9.0	12.0	5.0	13.0	16.0	14.0	19.0
3	DO (mg/L)	4.1	4.2	8.0	10.2	7.1	7.5	10.0	9.9	8.7	8.9	7.8	7.3
4	DO_SAT% (%)	55	54	103	128	92	91	116	109	92	102	96	92
5	FCol-MPN (MPN/100mL)	170	170	130	78	230	68	68	18	15	17	15	11
6	Tcol-MPN (MPN/100mL)	790	3500	790	790	330	270	330	310	78	330	230	20
	TRACE & TOXIC												
1	Al (mg/L)	0.04	0.05	0.03	0.06	0.04	0.04	0.03	0.04	0.04	0.04	0.03	0.04
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	171	153	119	125	91	131	128	142	125	132	125	126
2	HAR_Total (mgCaCO3/L)	228	204	178	169	172	196	193	185	192	197	179	179
3	Na% (%)	21	27	16	28	24	26	26	32	25	29	25	22
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	1.0	0.5	1.0	0.9	1.0	1.0	1.3	0.9	1.1	0.9	0.8
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
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	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
1	As	Arsenic	microgram /1	-	-	-			-	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	0.27	5.78	3.00	5.063
2	Cd	Cadmium	microgram /1	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	0.12	0.02	0.00	0.00
3	Cr	Chromium	microgram /1	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	0.52	1.08	5.00	0.00
4	Cu	Copper	microgram /1	-	-	-			-	6.44	6.60	-	94.00	9.40	3.56	-	1.99	-	-	6.60	8.58	-	0.66	0.78	-	3.46	6.23	3.19	2.00	6.10
5	Hg	Mercury	microgram /1	-	1.088	0			-	0.59	-	0	-	-	-	0.26	0.257	0.08	0.00	0.00	-	-	0.126	-	-	0.00	-	-	-	-	0.000
6	Ni	Nickel	microgram /1	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	2.47	3.52	19.0	0.00
7	Pb	Lead	microgram /1	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	1.07	0.60	34.0	0.00
8	Zn	Zinc	microgram /1	7	24.00	31.82	R I V E R	R I V E R	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	2.47	3.40	22.0	18.86
b	Pesticides		microgram /1				D R Y	D R Y								Pesticides value not reported .		Pesticides value not reported .												
1	Aldrin	Aldrin	microgram /1	0.008	0.01	0			0	-	-	0.0094	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
2	Alpha- BHC	Alpha- BHC	microgram /1	0.015	0.01	0			0.116	-	-	0.0816	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
3	Beta-BHC	Beta-BHC	microgram /1	0	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram /1	0.016	0.01	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
5	D- BHC	D- BHC	microgram /1	-	0.02	-			-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
6	DDT	DDT	microgram /1	0.003	0	0.01			0.018	-	-	0.0026	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
7	Dieldrin	Dieldrin	microgram /1	0.035	0.02	0			0.065	-	-	0.0008	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
8	Endos-I	Endosulphan I	microgram /1	0.007	0.01	0.01			0.209	-	-	0.6913	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
9	Endos-II	Endosulphan II	microgram /1	0	0.01	-			-	-	-		-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-
10	Endos-s	Endosulphan s	microgram /1	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 : 2016-2017

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	11915	0.000	138.9
2	EC_FLD (µmho/cm)	12	593	502	556
3	EC_GEN (µmho/cm)	12	534	343	455
4	pH_FLD (pH units)	12	8.3	7.3	7.7
5	pH_GEN (pH units)	12	8.8	8.1	8.5
6	SS (mg/L)	12	44	7	27
7	TDS (mg/L)	12	346	220	289
8	Temp (deg C)	12	32.0	18.0	25.5
9	Turb (NTU)	12	46.0	1.0	8.5
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	14.1	0.0	8.5
2	ALK-TOT (mgCaCO3/L)	12	173	124	146
3	Ca (mg/L)	12	69	36	52
4	Cl (mg/L)	12	54.0	20.0	41.8
5	CO3 (mg/L)	12	17.0	0.0	10.3
6	F (mg/L)	12	0.80	0.42	0.58
7	Fe (mg/L)	12	0.5	0.2	0.3
8	HCO3 (mg/L)	12	185	127	157
9	K (mg/L)	12	3.6	0.9	2.1
10	Mg (mg/L)	12	19.4	10.2	14
11	Na (mg/L)	12	40.3	15.4	29.6
12	NH3-N (mg N/L)	12	1.15	0.07	0.52
13	NO2+NO3 (mg N/L)	12	7.50	0.83	3.06
14	NO2-N (mgN/L)	12	0.05	0.01	0.03
15	NO3-N (mgN/L)	12	7.45	0.82	3.03
16	P-Tot (mgP/L)	12	0.110	0.040	0.069
17	SiO2 (mg/L)	12	56.3	11.3	32.6
18	SO4 (mg/L)	12	44.4	18.6	26.9
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	4.2	1.7	2.9
2	COD (mg/L)	12	19.0	5.0	12.6
3	DO (mg/L)	12	10.2	4.1	7.8
4	DO_SAT% (%)	12	128	54	94
5	FCol-MPN (MPN/100mL)	12	230	11	83
6	Tcol-MPN (MPN/100mL)	12	3500	20	647
	TRACE & TOXIC				
1	Al (mg/L)	12	0.06	0.03	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	171	91	131
2	HAR_Total (mgCaCO3/L)	12	228	169	189
3	Na% (%)	12	32	16	25
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	1.3	0.5	0.9
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Mahi | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	139.8	7.551	13.05	7.068	0.716	10.10	2.605	38.04	10.59	28.12	13.20	10.48	17.51	4.263	5.189	3.291	1.535	1.408	1.564	10.16	5.347	8.183	10.48	11.83	12.06
2	EC_FLD (µmho/cm)	514	467	516	456	425	405	520	427	522	542	537	546	684	618	536	553	515	516	693	549	567	576	583	568	587	557	496	556	572	578	497	519	527	489	529	558
3	EC_GEN (µmho/cm)	474	439	460	418	422	402	429	419	452	509	453	445	517	544	487	472	506	440	520	498	554	491	447	489	521	510	472	437	571	470	432	467	481	485	402	426
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	7.6	8.1	8.6	8.8	8.8	8.3	8.9	9.7	7.6	8.1	7.9	7.6	7.7	8.3	8.8	9.0	8.9	7.9	8.4	8.9	7.7	8.0	7.9	7.4	8.0
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	8.4	8.1	8.3	8.4	8.1	8.0	8.3	8.0	8.4	8.4	8.4	8.2	8.4	8.1	8.4	8.5	8.1	7.7	7.9	8.4	8.5	8.4	8.4	8.3	8.6
6	SS (mg/L)	45	56	24	24	27	43	47	41	39	57	72	22	18	25	20	24	25	35	35	45	49	71	29	25	21	23	15	20	28	41	48	36	25	68	19	39
7	TDS (mg/L)	315	287	300	264	275	257	271	265	292	327	287	282	334	343	312	292	319	266	331	305	349	309	280	312	339	313	291	272	366	296	268	290	307	305	254	270
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	28.9	21.7	23.5	21.8	23.0	26.3	20.5	24.3	22.6	21.8	19.3	25.0	21.5	27.3	28.4	26.1	23.5	25.0	22.0	28.1	28.6	27.7	24.7	28.7	25.0
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	15.8	8.0	9.3	1.3	2.0	2.0	7.0	6.3	4.3	12.3	6.0	4.5	3.8	7.3	3.7	2.0	2.0	3.0	4.0	4.0	3.0	5.3	4.0	3.3	2.7
	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	7.6	0.0	1.2	5.0	0.0	0.4	0.4	2.1	2.9	7.9	4.6	0.0	7.9	0.6	3.3	2.8	0.0	0.0	0.0	0.6	1.7	8.3	9.4	6.6	10.8
2	ALK-TOT (mgCaCO3/L)	194	212	222	188	131	132	131	144	155	162	126	143	237	246	246	233	167	127	185	168	181	162	134	148	240	231	211	216	196	144	151	171	170	146	141	150
3	Ca (mg/L)	32	35	38	36	42	44	45	50	49	52	36	53	37	36	44	42	55	45	69	60	62	56	54	53	38	37	40	40	63	50	52	60	58	47	56	51
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	38.8	40.0	54.5	43.0	36.0	61.0	48.0	40.0	32.5	42.5	41.5	33.5	48.0	44.0	58.7	36.0	34.0	66.0	47.0	35.3	39.3	38.7	40.0	29.3	38.7
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	9.2	0.0	1.5	6.0	0.0	0.5	0.5	2.5	3.5	9.5	5.5	0.0	9.5	0.7	4.0	3.3	0.0	0.0	0.0	0.7	2.0	10.0	11.3	8.0	13.0
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	0.51	0.26	0.72	0.67	0.34	0.75	0.53	0.66	0.53	0.69	0.47	0.95	0.65	0.29	0.78	0.62	0.33	0.67	0.83	0.61	0.80	0.74	0.68	0.77	0.62
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	0.4	0.0	0.0	0.1	0.2	0.4	0.6	0.6	0.6	0.6	0.5	0.3	0.3	0.0	0.0	0.1	0.2	0.4	0.7	0.6	0.5	0.6	0.5	0.3	0.2
8	HCO3 (mg/L)	117	129	134	112	159	161	159	176	188	182	139	155	145	149	144	142	202	154	221	198	201	187	164	161	146	137	125	132	239	176	182	205	187	155	156	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	1.7	1.6	1.1	0.5	1.2	1.1	1.4	0.8	0.8	0.9	0.9	1.8	2.6	1.3	0.7	0.8	0.7	0.9	2.0	0.7	0.8	0.7	0.9	1.9	2.1
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	13.9	9.7	11.4	10.7	6.8	11.9	8.0	8.5	9.7	11.7	13.1	11.2	14.3	9.5	9.6	10.7	5.8	14.6	10.2	11.0	11.3	12.3	12.8	12.1	13.7
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	26.8	29.1	41.8	31.6	27.8	46.9	36.2	27.6	22.9	28.4	27.6	23.2	33.2	32.7	45.1	24.5	24.3	48.3	35.2	23.4	24.1	27.5	28.6	22.0	29.2
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	0.24	0.09		0.06	0.32	0.08	0.29	0.35	0.29	0.38	0.36	0.34	0.71	0.09		0.12	0.29	0.12	0.40	0.22	0.46	0.73	0.25	0.29	0.74
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	1.72	0.57	0.25	1.41	0.84	0.55	0.57	2.30	2.12	1.41	0.92	1.20	4.17	0.29	0.19	0.60	0.77	0.84	0.80	0.72	1.13	1.80	0.45	1.13	3.78
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	0.02	0.00	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.04	0.04	0.01	0.01	0.01	0.02	0.01	0.02	0.03	0.04	0.02	0.02	0.03
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	1.70	0.57	0.22	1.39	0.83	0.53	0.55	2.29	2.10	1.39	0.91	1.19	4.13	0.25	0.17	0.59	0.76	0.82	0.79	0.70	1.10	1.76	0.44	1.11	3.75
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	0.088	0.047	0.020	0.020	0.070	0.120	0.098	0.105	0.095	0.103	0.100	0.067	0.060	0.043	0.010	0.020	0.070	0.130	0.100	0.107	0.090	0.097	0.100	0.070	0.050
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	23.3	19.1	26.8	26.7	20.5	24.8	30.5	29.4	32.0	20.9	24.8	23.2	33.0	20.2	29.6	23.1	20.9	22.2	21.5	9.0	28.2	20.8	19.9	32.0	47.4
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	35.8	18.2	18.4	23.2	11.0	20.3	20.6	12.8	11.6	11.8	16.1	36.0	21.0	20.1	19.8	23.1	10.2	20.9	21.4	14.2	11.6	12.1	17.5	41.1	20.0
	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	3.1	0.7	1.5	1.7	1.6	1.7	1.5	1.5	0.9	1.6	5.4	2.5	2.4	0.6	1.9	2.7	2.5	2.3	2.0	1.9	1.7	2.7	4.7	2.8	3.3
2	COD (mg/L)										72.8	44.7	12.6									126.5	29.7	41.2	9.8									45.8	62.4	13.3	16.3
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	6.7	7.7	8.6	10.4	9.8	8.8	8.8	9.3	8.9	9.0	10.4	9.2	9.0	7.2	8.8	8.8	8.1	7.9	8.9	8.1	7.4	8.4	7.3	7.4	8.0
4	DO_SAT% (%)	81	79	95	122	105	92	96	79	97	82	85	86	87	101	116	114	109	98	110	103	102	111	111	102	90	113	109	95	96	101	101	94	107	88	96	97
5	FCol-MPN (MPN/100mL)										2800	4772	156									100	2475	145	42									933	1464	217	14
6	Tcol-MPN (MPN/100mL)										24360	24434	1240									12409	22475	294	247									25001	2733	1077	193
	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	0.04	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.02	0.02	0.02	0.02	0.03	0.04	0.03	0.03	0.03	0.04	0.04	0.04
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	81	87	94	91	106	111	112	124	123	131	91	132	93	90	111	104	137	113	172	149	155	139	136	132	96	93	99	100	156	124	131	151	144	118	140	128
2	HAR_Total (mgCaCO3/L)	109	122	132	119	143	146	151	166	174	185	161	190	133	137	156	133	187	147	208	190	204	194	183	191	135	133	143	124	217	167	177	198	196	171	190	185
3	Na% (%)	32	28	37	28	38	33	26	21	25	22	24	23	32	40	31	31	35	35	22	21	23	24	22	27	34	42	27	30	33	31	22	21	24	27	20	25
4	SAR (-)	1.0	0.9	1.4	0.9	1.5	1.2	0.8	0.7	0.9	0.8	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	1.0	1.2	1.7	0.9	0.9	1.4	1.2	0.8	0.7	0.9	1.0	0.7	0.9
	PESTICIDES																																				

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	13.26	18.85	33.52	587.3	205.2	61.06	22.68	15.52	14.54	16.24	12.70	10.54
2	Colour_Cod (-)	Clear	Clear	Light Brown	Light Brown	Light Brown	Clear	Clear	Clear	Clear	Clear	Light Brown	Clear
3	EC_FLD (µmho/cm)	477	483	425	324	398	405	443	456	455	445	419	460
4	EC_GEN (µmho/cm)	429	422	352	259	338	409	417	406	412	419	395	389
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)	8.9	9.3	9.5	9.1	9.2	8.4	8.4	8.3	8.8	8.8	9.3	9.2
7	pH_GEN (pH units)	8.7	8.6	8.6	8.2	8.5	8.5	8.6	8.6	8.5	8.7	8.6	9.0
8	SS (mg/L)	26	48	4	40	46	51	44	30	7	21	15	26
9	TDS (mg/L)	265	260	226	160	212	254	258	256	265	261	257	245
10	Temp (deg C)	33.0	32.0	30.0	29.0	31.0	26.5	23.0	21.0	20.0	20.0	30.0	32.0
11	Turb (NTU)	3.0	2.0	9.0	48.0	3.0	3.0	6.0	9.0	9.0	2.0	5.0	1.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	18.3	8.3	10.0	0.0	15.8	11.6	11.6	14.1	15.8	10.0	14.1	11.6
2	ALK-TOT (mgCaCO3/L)	165	161	124	104	112	111	147	156	151	148	141	147
3	Ca (mg/L)	63	55	42	37	35	35	45	49	43	46	43	44
4	Cl (mg/L)	36.0	34.0	24.0	18.0	22.0	32.0	46.0	50.0	46.0	46.0	42.0	34.0
5	CO3 (mg/L)	22.0	10.0	12.0	0.0	19.0	14.0	14.0	17.0	19.0	12.0	17.0	14.0
6	F (mg/L)	0.33	0.66	0.64	0.59	0.36	0.44	0.17	0.57	0.64	0.67	0.67	0.78
7	Fe (mg/L)	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1
8	HCO3 (mg/L)	156	176	127	127	98	107	151	156	146	156	137	151
9	K (mg/L)	1.6	1.3	1.2	0.8	1.8	2.0	3.0	2.4	2.7	1.6	1.5	2.0
10	Mg (mg/L)	9.7	11.7	8.8	8.0	11.4	14.3	12.4	10.7	14.1	13.6	12.2	13.6
11	Na (mg/L)	23.7	25.8	17.5	12.3	16.4	23.7	34.7	38.4	34.9	35.5	31.3	25.9
12	NH3-N (mg N/L)	0.09	0.19	0.31	0.32	0.28	0.58	0.97	0.32	1.07	1.09	0.76	0.33
13	NO2+NO3 (mg N/L)	0.93	1.47	1.14	2.59	3.14	6.90	2.20	1.58	2.37	2.43	2.32	2.30
14	NO2-N (mgN/L)	0.08	0.02	0.06	0.01	0.02	0.05	0.04	0.02	0.03	0.03	0.04	0.05
15	NO3-N (mgN/L)	0.85	1.45	1.08	2.58	3.12	6.85	2.16	1.56	2.34	2.40	2.28	2.25
16	P-Tot (mgP/L)	0.070	0.080	0.060	0.050	0.050	0.060	0.050	0.040	0.040	0.050	0.040	0.040
17	SiO2 (mg/L)	36.9	25.0	22.4	22.3	25.3	36.4	36.6	11.6	36.2	36.6	56.3	38.4
18	SO4 (mg/L)	14.5	14.7	13.5	8.7	11.8	12.5	12.4	11.9	12.1	12.8	11.3	11.3
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	5.5	1.2	2.3	1.4	3.4	3.3	2.9	2.7	4.3	5.0	3.3	3.0
2	COD (mg/L)	10.0	7.0	4.0	3.0	10.0	9.0	15.0	6.0	16.0	13.0	14.0	10.0
3	DO (mg/L)	10.2	6.3	7.2	7.7	8.9	8.9	9.6	10.0	10.8	10.8	11.7	8.7
4	DO_SAT% (%)	143	86	95	100	120	110	112	112	118	119	154	118
5	FCol-MPN (MPN/100mL)	20	20	2	210	230	130	78	16	10	16	45	45
6	Tcol-MPN (MPN/100mL)	130	170	78	940	490	700	490	170	40	790	78	110
	TRACE & TOXIC												
1	Al (mg/L)	0.05	0.03	0.04	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	158	136	105	93	88	88	113	122	108	115	108	111
2	HAR_Total (mgCaCO3/L)	199	185	142	127	136	148	165	167	167	172	159	168
3	Na% (%)	20	23	21	17	21	26	31	33	31	31	30	25
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 (-)	0.7	0.8	0.6	0.5	0.6	0.9	1.2	1.3	1.2	1.2	1.1	0.9
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	0.34	2.09	1.00	1.521
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	0.09	0.01	0.00	0.00
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	0.12	1.92	3.00	0.00
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	4.94	4.00	3.00	5.00
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	-	-	-	-	0.000
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	1.60	3.28	22.0	0.00
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	1.25	0.84	1.00	0.00
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	1.60	6.10	18.0	19.95
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 : 2016-2017

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	13879	7.483	188.6
2	EC_FLD (µmho/cm)	12	483	324	433
3	EC_GEN (µmho/cm)	12	429	259	387
4	pH_FLD (pH units)	12	9.5	8.3	8.9
5	pH_GEN (pH units)	12	9.0	8.2	8.6
6	SS (mg/L)	12	51	4	30
7	TDS (mg/L)	12	265	160	243
8	Temp (deg C)	12	33.0	20.0	27.3
9	Turb (NTU)	12	48.0	1.0	8.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	18.3	0.0	11.8
2	ALK-TOT (mgCaCO3/L)	12	165	104	139
3	Ca (mg/L)	12	63	35	45
4	Cl (mg/L)	12	50.0	18.0	35.8
5	CO3 (mg/L)	12	22.0	0.0	14.2
6	F (mg/L)	12	0.78	0.17	0.54
7	Fe (mg/L)	12	0.3	0.1	0.2
8	HCO3 (mg/L)	12	176	98	141
9	K (mg/L)	12	3.0	0.8	1.8
10	Mg (mg/L)	12	14.3	8.0	11.7
11	Na (mg/L)	12	38.4	12.3	26.7
12	NH3-N (mg N/L)	12	1.09	0.09	0.53
13	NO2+NO3 (mg N/L)	12	6.90	0.93	2.45
14	NO2-N (mgN/L)	12	0.08	0.01	0.04
15	NO3-N (mgN/L)	12	6.85	0.85	2.41
16	P-Tot (mgP/L)	12	0.080	0.040	0.052
17	SiO2 (mg/L)	12	56.3	11.6	32
18	SO4 (mg/L)	12	14.7	8.7	12.3
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	5.5	1.2	3.2
2	COD (mg/L)	12	16.0	3.0	9.8
3	DO (mg/L)	12	11.7	6.3	9.2
4	DO_SAT% (%)	12	154	86	116
5	FCol-MPN (MPN/100mL)	12	230	2	69
6	Tcol-MPN (MPN/100mL)	12	940	40	349
	TRACE & TOXIC				
1	Al (mg/L)	12	0.05	0.02	0.03
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	158	88	112
2	HAR_Total (mgCaCO3/L)	12	199	127	161
3	Na% (%)	12	33	17	26
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	1.3	0.5	0.9
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Mahi | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	171.6	40.42	38.04	27.17	22.61	9.746	9.095	17.35	21.07	48.81	27.02	17.02	28.45	23.31	29.13	23.65	21.10	8.619	8.282	7.026	10.87	26.16	20.88	14.76	13.16
2	EC_FLD (µmho/cm)	610	453	391	402	376	577	402	413	420	430	400	421	484	482	400	410	440	386	474	364	367	407	417	440	410	451	415	412	585	377	480	482	482	479	467	441
3	EC_GEN (µmho/cm)	375	367	328	476	481	533	467	435	367	424	357	360	587	465	505	536	665	593	492	454	470	479	373	411	410	436	454	555	577	577	428	444	430	443	393	401
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	9.2	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	8.5	8.1	7.9	7.7	6.9	7.3	8.3	8.3	7.2	8.9	9.1
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	8.5	8.2	8.4	8.3	8.0	7.9	8.3	7.9	8.5	8.4	8.5	8.5	8.6	8.4	8.5	8.5	8.0	7.9	7.7	8.8	8.7	8.5	8.7	8.6	8.8
6	SS (mg/L)	50	39	21	16	30	40	52	44	116	40	77	33	27	17	25	24	24	28	46	47	41	55	41	33	16	29	22	36	32	35	48	52	19	52	30	21
7	TDS (mg/L)	245	230	205	312	307	331	297	278	235	266	227	225	380	288	325	335	420	382	308	275	300	307	233	258	271	278	293	351	368	365	281	275	278	277	244	254
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	31.0	22.8	24.9	22.1	21.4	22.1	21.2	18.5	22.3	22.8	22.4	24.8	22.6	26.8	27.8	25.5	24.8	26.2	19.2	28.0	28.0	26.8	26.3	28.3	27.3
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	13.0	5.8	7.8	4.5	1.5	1.5	5.0	3.3	4.8	4.3	3.0	1.8	6.8	5.3	6.3	1.7	1.3	2.0	3.7	2.0	2.7	3.0	4.0	2.3	2.7
	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	10.5	0.4	3.5	1.5	1.0	0.0	1.5	0.0	7.5	5.8	10.4	7.5	13.3	0.8	5.8	3.9	0.0	0.0	0.0	6.6	4.7	7.5	12.7	8.9	11.9
2	ALK-TOT (mgCaCO3/L)	184	192	174	207	178	159	134	145	134	151	111	133	232	192	275	254	198	166	166	154	158	167	127	141	203	212	226	259	179	156	156	173	156	150	146	145
3	Ca (mg/L)	31	32	29	39	41	53	47	53	45	49	34	46	36	32	46	44	59	60	68	55	57	55	46	43	33	33	37	46	60	51	57	60	53	41	52	45
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	26.8	40.5	39.3	45.5	41.5	77.5	78.5	38.0	36.5	35.0	40.0	27.5	43.5	29.3	50.9	38.7	53.3	66.7	76.0	32.7	36.0	34.0	34.0	29.3	40.7
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	12.6	0.5	4.3	1.8	1.3	0.0	1.8	0.0	9.0	7.0	12.5	9.0	16.0	1.0	7.0	4.7	0.0	0.0	0.0	8.0	5.7	9.0	15.3	10.7	14.3
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	0.52	0.30	0.56	0.52	0.46	0.63	0.49	0.41	0.50	0.59	0.47	0.60	0.45	0.25	0.69	0.58	0.42	0.65	0.60	0.51	0.79	0.63	0.51	0.69	0.71
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	0.2	0.0	0.0	0.1	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.1
8	HCO3 (mg/L)	111	117	104	122	151	194	164	169	161	159	119	137	141	113	166	154	242	199	203	170	178	178	137	140	123	122	133	158	218	190	174	200	172	151	156	148
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	1.3	1.8	0.7	0.5	1.6	1.2	1.3	0.8	0.7	0.9	0.9	1.5	2.5	1.0	0.6	1.0	0.8	0.9	1.6	0.6	0.7	0.9	0.8	1.3	1.7
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	9.9	9.1	7.7	10.5	9.2	16.3	11.2	7.5	9.7	10.2	18.2	9.7	12.9	8.0	8.8	9.7	10.7	11.0	11.7	9.4	11.7	11.7	17.7	10.0	13.1
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	19.1	29.3	29.5	33.2	30.7	59.1	57.9	26.8	24.5	25.3	25.5	18.2	32.9	19.3	39.2	26.6	35.5	49.5	57.2	22.3	24.1	25.1	24.8	20.2	30.9
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	0.24	0.07		0.07	0.18	0.15	0.30	0.38	0.28	0.49	0.14	0.35	0.74	0.05	0.06	0.17	0.29	0.14	0.19	0.44	0.16	0.49	0.30	0.27	0.73
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	1.85	0.13	1.17	1.95	1.03	0.95	2.51	4.05	1.73	2.52	2.89	1.77	3.26	0.04	1.11	1.15	0.91	0.80	1.25	2.12	1.58	2.78	1.27	0.93	2.35
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	0.04	0.02	0.02	0.08	0.02	0.05	0.02	0.04	0.03	0.04	0.02	0.01	0.03	0.00	0.02	0.03	0.03	0.03	0.04	0.05	0.03	0.06	0.02	0.01	0.04
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	1.82	0.11	1.16	1.88	1.01	0.90	2.50	4.01	1.70	2.48	2.86	1.76	3.23	0.04	1.08	1.12	0.88	0.77	1.22	2.07	1.55	2.72	1.25	0.91	2.31
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	0.062	0.027	0.017	0.025	0.040	0.088	0.063	0.070	0.060	0.063	0.070	0.060	0.047	0.013	0.037	0.023	0.043	0.080	0.063	0.067	0.057	0.067	0.060	0.063	0.043
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	26.4	18.7	21.6	26.1	24.1	33.9	30.7	32.4	28.6	28.3	31.3	24.6	30.2	19.3	30.1	23.4	26.4	28.2	31.9	13.4	33.2	26.6	22.8	30.8	43.8
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	12.6	14.5	13.8	13.4	19.4	21.7	22.9	16.4	15.5	15.2	18.3	13.3	12.2	11.2	16.3	13.6	18.8	21.9	23.4	16.8	15.1	15.4	17.4	13.9	11.8
	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	2.8	0.6	1.1	1.9	1.4	1.4	1.6	1.2	1.1	1.7	2.5	1.0	3.3	0.4	1.6	1.5	1.1	2.0	1.8	1.3	1.5	2.1	1.0	2.7	3.8
2	COD (mg/L)										53.2	46.9	6.8									118.2	34.6	13.2	11.5									26.6	33.1	12.3	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	8.1	7.1	8.9	9.5	7.7	7.0	6.6	8.7	10.0	9.5	9.9	8.5	9.8	7.3	8.5	8.4	5.1	5.9	5.9	9.4	7.6	9.0	7.3	8.5	10.4
4	DO_SAT% (%)	79	99	94	89	85	76	70	99	88	92	93	109	82	107	108	87	80	75	92	113	110	113	102	113	90	107	101	61	73	63	120	97	111	90	110	131
5	FCol-MPN (MPN/100mL)										3565	4186	96									94	2610	73	59									1400	297	70	35
6	Tcol-MPN (MPN/100mL)										37900	28914	362									11530	26875	273	350									24634	1177	206	326
	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	0.03	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.02	0.04	0.53	0.04	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.05	0.03	0.04	0.03
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	78	79	73	99	103	131	118	131	111	122	86	116	89	80	116	109	148	149	169	136	142	136	115	108	83	84	94	116	151	128	143	150	134	103	130	112
2	HAR_Total (mgCaCO3/L)	102	113	107	129	146	181	158	170	159	172	138	158	127	112	160	148	216	196	201	177	185	212	155	162	116	120	134	161	197	177	182	198	182	177	171	166
3	Na% (%)	29	27	34	32	36	32	30	22	19	20	22	21	32	36	31	31	37	39	22	23	23	21	20	30	26	41	30	32	35	41	21	21	23	23	20	29
4	SAR (-)	0.9	0.8	1.1	1.1	1.4	1.3	1.1	0.8	0.6	0.7	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	1.1	0.8	1.6	1.0	1.2	1.5	1.9	0.7	0.7	0.8	0.8	0.7	1.0
	PESTICIDES																																				

3. SABARMATI BASIN

3.0 Sabarmati Basin

3.1 Basin description

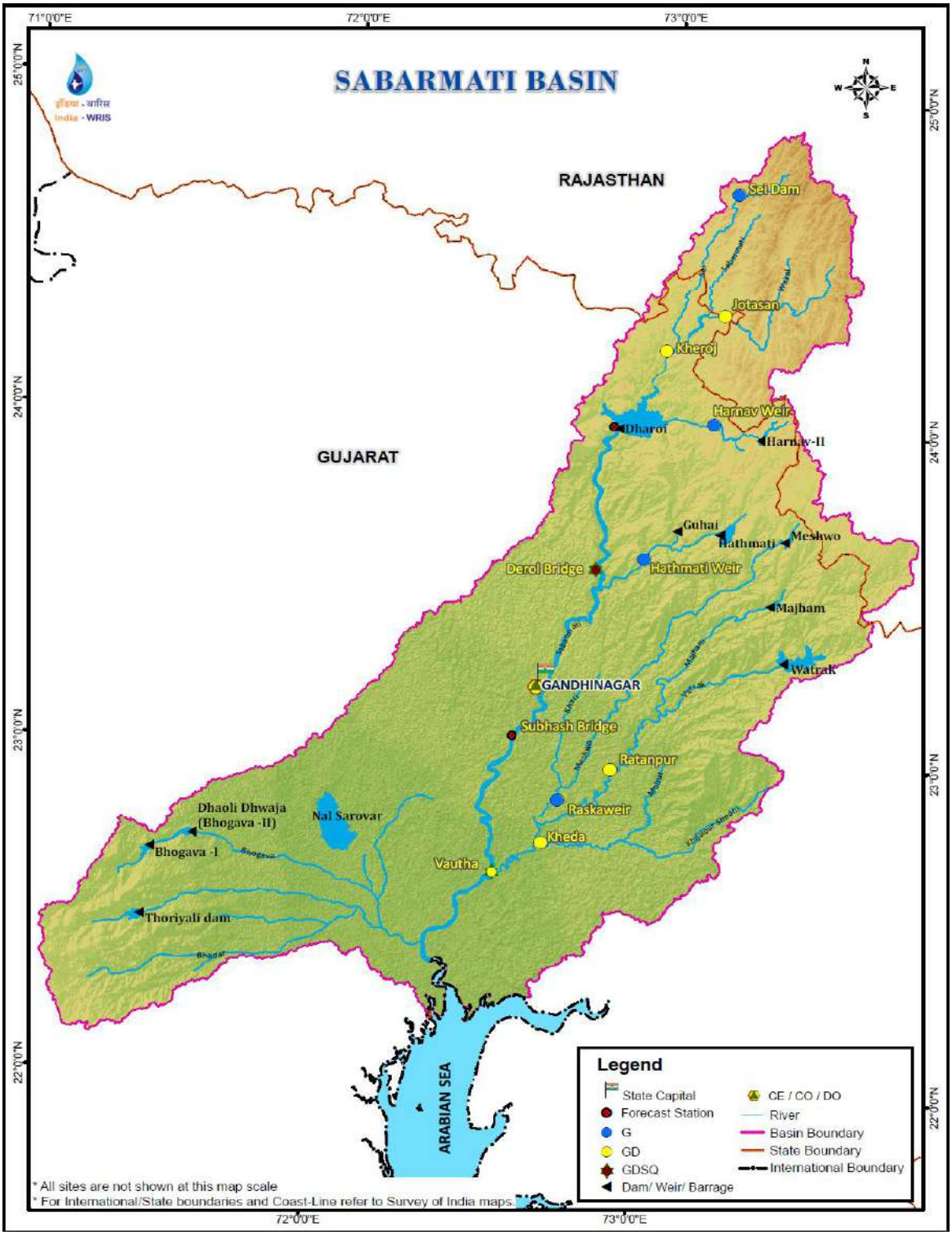
The Sabarmati is one of the major west flowing interstate rivers in India. Its basin map is enclosed. It originates in the foothills of Aravalli range at an elevation of 762 m above mean sea level. It traverses a length of 371 km in southwest direction. It flows initially in Rajasthan for about 48 km 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

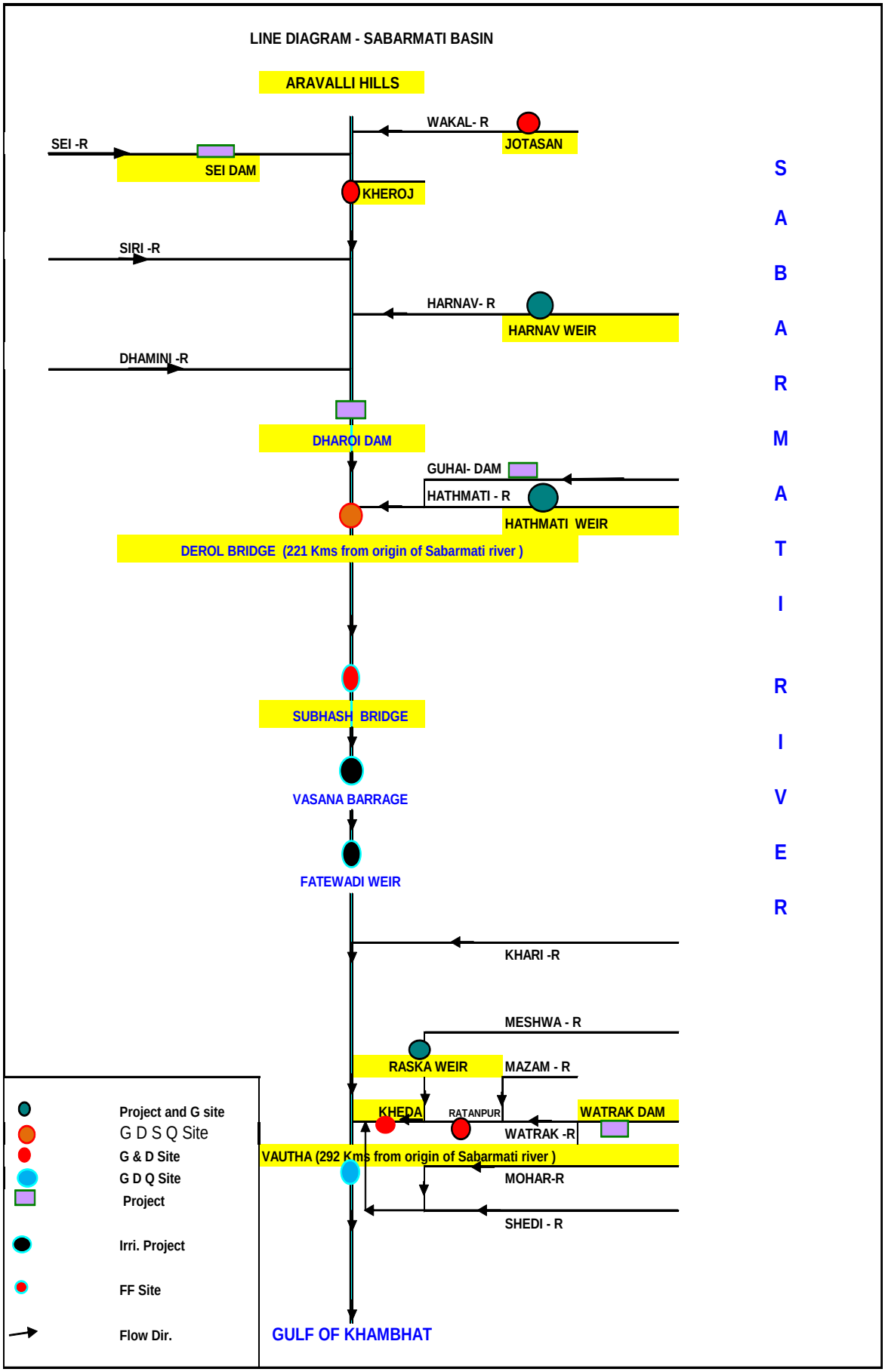
The important tributaries are Sai, Wakal, Harnav, Hathmati and Watrak. The left bank tributary Wakal joins the river at 51 km of its run from the origin. It receives the Sai, a major right bank tributary near Mahuri and then Harnav on the left bank at about 103 km. Below this confluence, the Sabarmati 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
RAJASTHAN
GUJARAT
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
ARABIAN SEA
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	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	360.6	1.070	0.170	0.250	0.170	0.110	0.060	0.000	0.000
2	Colour_Cod (-)			Clear		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			830		440		430		457		462	
4	EC_GEN (µmho/cm)			482		502		521		421		414	
5	Odour_Code (-)			odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			7.3		7.6		7.4		7.3		7.6	
7	pH_GEN (pH units)			8.5		8.3		8.6		8.4		8.4	
8	SS (mg/L)			25		48		48		46		55	
9	TDS (mg/L)			315		326		326		262		253	
10	Temp (deg C)			29.0		28.0		27.0		27.0		26.0	
11	Turb (NTU)			9.0		3.0		5.0		4.0		3.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			8.3		11.6		11.6		5.8		5.8	
2	ALK-TOT (mgCaCO3/L)			133		151		175		128		131	
3	Ca (mg/L)			44		32		42		38		38	
4	Cl (mg/L)		O	62.0	O	62.0	O	70.0	O	52.0	O	50.0	O
5	CO3 (mg/L)		N	10.0	N	14.0	N	14.0	N	7.0	N	7.0	N
6	F (mg/L)		C	0.80	C	0.44	C	0.92	C	0.90	C	0.91	C
7	Fe (mg/L)	R	E	0.1	E	0.1	E	0.1	E	0.1	E	0.1	E
8	HCO3 (mg/L)	I		142		156		185		142		146	
9	K (mg/L)	V		1.1		0.9		1.5		4.0		3.0	
10	Mg (mg/L)	E	I	12.6	I	20.4	I	20.4	I	13.4	I	12.2	I
11	Na (mg/L)	R	N	42.4	N	40.4	N	53.9	N	39.2	N	37.5	N
12	NH3-N (mg N/L)			0.32		0.42		0.68		0.77		0.76	
13	NO2+NO3 (mg N/L)		2	0.55	2	0.56	2	3.92	2	3.85	2	3.73	2
14	NO2-N (mgN/L)			0.05		0.04		0.05		0.04		0.07	
15	NO3-N (mgN/L)	D	M	0.50	M	0.52	M	3.87	M	3.81	M	3.66	M
16	P-Tot (mgP/L)	R	O	0.070	O	0.070	O	0.060	O	0.060	O	0.050	O
17	SiO2 (mg/L)	Y	N	13.1	N	22.0	N	25.3	N	24.0	N	42.2	N
18	SO4 (mg/L)		T	12.3	T	9.4	T	10.3	T	9.7	T	9.7	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			1.6		3.0		2.4		1.6		1.8	
2	COD (mg/L)			4.0		4.0		5.0		12.0		4.0	
3	DO (mg/L)			6.8		8.4		7.1		9.2		7.1	
4	DO_SAT% (%)			88		108		90		115		88	
5	FCol-MPN (MPN/100mL)			220		790		45		20		78	
6	Tcol-MPN (MPN/100mL)			790		1300		3500		490		230	
	TRACE & TOXIC												
1	Al (mg/L)			0.04		0.03		0.02		0.02		0.02	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			109		79		104		96		96	
2	HAR_Total (mgCaCO3/L)			162		164		189		152		147	
3	Na% (%)			36		35		38		35		35	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			1.5		1.4		1.7		1.4		1.4	
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	0.14	3.42	2.00	1.109
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	0.09	0.06	0.00	0.00
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	0.05	3.73	4.00	0.00
4	Cu	Copper	microgram / l							5.50				7.22			BDL	-	2.28	4.40	9.72	-	1.32	4.15	-	4.94	8.02	3.96	1.00	4.10
5	Hg	Mercury	microgram / l							0.56				-			BDl	0.051	-	-	-	0.135	-	-	0.00	-	-	-	-	0.036
6	Ni	Nickel	microgram / l							-				4.27	O	O	8.73	0.00	1.10	0.11	1.67	4.36	0.32	3.13	0.00	0.13	1.71	7.78	15.0	4.50
7	Pb	Lead	microgram / l							3.18				0.760	N	O	4.680	0.00	1.814	0.45	10.37	13.00	0.45	0.08	0.00	1.31	1.97	0.92	1.00	0.00
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	12.29	R I V E R	R I V E R	R I V E R	12.43	C E I N	L I N G	13.00	19.60	2.00	14.00	9.30	4.00	4.80	3.50	0.00	4.10	1.71	5.40	16.0	9.50
b	**Pesticides**		microgram / l																											
1	Aldrin	Aldrin	microgram / l							-				-		C	-		-	-	-	-	-	-	-	-	-	-	-	-
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	-	2 M O N T H	O N D I T I O N	-	Pesticides value not reported.	-	-	-	-	-	-	-	-	-	-	-	-
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 : 2016-2017

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)	356	830.3	0.000	16.47
2	EC_FLD (µmho/cm)	5	830	430	524
3	EC_GEN (µmho/cm)	5	521	414	468
4	pH_FLD (pH units)	5	7.6	7.3	7.4
5	pH_GEN (pH units)	5	8.6	8.3	8.4
6	SS (mg/L)	5	55	25	44
7	TDS (mg/L)	5	326	253	296
8	Temp (deg C)	5	29.0	26.0	27.4
9	Turb (NTU)	5	9.0	3.0	4.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	11.6	5.8	8.6
2	ALK-TOT (mgCaCO3/L)	5	175	128	144
3	Ca (mg/L)	5	44	32	39
4	Cl (mg/L)	5	70.0	50.0	59.2
5	CO3 (mg/L)	5	14.0	7.0	10.4
6	F (mg/L)	5	0.92	0.44	0.79
7	Fe (mg/L)	5	0.1	0.1	0.1
8	HCO3 (mg/L)	5	185	142	154
9	K (mg/L)	5	4.0	0.9	2.1
10	Mg (mg/L)	5	20.4	12.2	15.8
11	Na (mg/L)	5	53.9	37.5	42.7
12	NH3-N (mg N/L)	5	0.77	0.32	0.59
13	NO2+NO3 (mg N/L)	5	3.92	0.55	2.52
14	NO2-N (mgN/L)	5	0.07	0.04	0.05
15	NO3-N (mgN/L)	5	3.87	0.50	2.47
16	P-Tot (mgP/L)	5	0.070	0.050	0.062
17	SiO2 (mg/L)	5	42.2	13.1	25.3
18	SO4 (mg/L)	5	12.3	9.4	10.3
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	3.0	1.6	2.1
2	COD (mg/L)	5	12.0	4.0	5.8
3	DO (mg/L)	5	9.2	6.8	7.7
4	DO_SAT% (%)	5	115	88	98
5	FCol-MPN (MPN/100mL)	5	790	20	231
6	Tcol-MPN (MPN/100mL)	5	3500	230	1262
	TRACE & TOXIC				
1	Al (mg/L)	5	0.04	0.02	0.03
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	109	79	97
2	HAR_Total (mgCaCO3/L)	5	189	147	163
3	Na% (%)	5	38	35	36
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	1.7	1.4	1.5
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	34.48	88.52	47.55	0.943	0.910	0.476	21.02	2.031	3.669	0.649	19.77	90.41	0.992	3.313	0.076	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.183	0.175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020
2	EC_FLD (µmho/cm)				562			994	989	713	658	884	635									988	426	437	444									430	423	437	462
3	EC_GEN (µmho/cm)	340	274	482	612	496	407	315	404	387	579	372	492									575	590	529	471									564	614	501	414
4	pH_FLD (pH units)				7.4			8.4	7.5	7.4	7.4	7.4	7.4									7.5	7.3	7.4	7.3									7.3	7.3	7.6	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	8.4					O	O	O	O	8.6	8.4	8.5	8.5	O	O	O	O	O	O	O	O	8.4	8.4	8.5	8.4
6	SS (mg/L)	30	591	26	17	30	35	73	60	84	60	208	37					N	N	N	N	45	66	86	47	N	N	N	N	N	N	N	N	30	68	40	55
7	TDS (mg/L)	238	190	306	390	322	249	196	250	252	378	237	321	O	O	O	O	C	C	C	C	368	375	347	294	C	C	C	C	C	C	C	C	358	376	325	253
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	28.5	N	N	N	N	E	E	E	E	26.5	27.5	26.0	27.0	E	E	E	E	E	E	E	E	29.0	28.0	29.0	26.0
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	6.0	C	C	C	C					5.0	4.5	1.0	4.5									5.0		5.0	3.0
	CHEMICAL													E	E	E	E	I	I	I	I					I	I	I	I	I	I	I	I				
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	10.0					N	N	N	N					N	N	N	N	N	N	N	N				
2	ALK-TOT (mgCaCO3/L)	180	154	228	280	128	107	96	152	116	164	104	142	I	I	I	I					10.0	7.1	10.0	8.7									4.2	10.0	5.8	5.8
3	Ca (mg/L)	31	23	38	46	40	34	30	48	38	52	29	38	N	N	N	N	2	2	2	2	148	170	134	152	2	2	2	2	2	2	2	2	132	160	131	131
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	62.0	2	2	2	2	M	M	M	M	81.0	101.0	64.0	61.0	M	M	M	M	M	M	M	M	80.0	110.0	60.0	50.0
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	12.0					O	O	O	O	12.0	8.5	12.0	10.5	O	O	O	O	O	O	O	O	5.0	12.0	7.0	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	0.62	M	M	M	M	N	N	N	N	0.59	0.36	0.59	0.91	N	N	N	N	N	N	N	N	0.41	0.43	0.80	0.91
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	0.1	O	O	O	O	T	T	T	T	0.2	0.2	0.1	0.1	T	T	T	T	T	T	T	T	0.3	0.2	0.2	0.1
8	HCO3 (mg/L)	110	94	139	171	142	129	118	171	142	188	113	149	N	N	N	N	H	H	H	H	157	191	140	164	H	H	H	H	H	H	H	H	151	171	146	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	1.0	T	T	T	T	/	/	/	/	1.0	0.9	0.9	2.8	/	/	/	/	/	/	/	/	1.1	0.7	1.3	3.0
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	16.5	H	H	H	H					12.2	16.8	12.3	16.9									7.8	17.3	11.7	12.1
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	41.4	/	/	/	/					50.2	74.2	40.9	46.5									52.8	76.8	43.5	37.5
12	NH3-N (mg N/L)			0.07	0.06	0.46	0.13	0.36	0.14	0.45	0.61	0.62	0.37					P	P	P	P	0.45	0.16	0.40	0.72	P	P	P	P	P	P	P	P	0.46	0.17	0.32	0.76
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	0.56	P	P	P	P	O	O	O	O	0.62	0.22	1.86	3.88	O	O	O	O	O	O	O	O	0.66	1.12	0.69	3.73
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	0.04	O	O	O	O	L	L	L	L	0.01	0.00	0.31	0.04	L	L	L	L	L	L	L	L	0.02	0.02	0.01	0.07
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	0.51	O	O	O	O	I	I	I	I	0.61	0.21	1.55	3.84	I	I	I	I	I	I	I	I	0.64	1.10	0.68	3.66
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	0.070	L	L	L	L	N	N	N	N	0.100	0.100	0.070	0.060	N	N	N	N	N	N	N	N	0.100	0.110	0.070	0.050
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	17.6	I	I	I	I	G	G	G	G	21.1	20.1	19.5	24.6	G	G	G	G	G	G	G	G	22.2	16.8	19.2	42.2
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	10.8	N	N	N	N					11.7	12.5	11.5	10.0									11.6	13.1	12.7	9.7
	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	2.3					O	O	O	O	1.0	0.5	1.3	2.0	O	O	O	O	O	O	O	O	1.2	1.3	3.8	1.8
2	COD (mg/L)										57.6	117.5	4.0	C	C	C	C	N	N	N	N	132.7	31.1	9.5	8.5	N	N	N	N	N	N	N	N	32.9	112.4	13.0	4.0
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	7.6	O	O	O	O	D	D	D	D	9.2	7.5	8.5	8.1	D	D	D	D	D	D	D	D	7.0	5.2	10.1	7.1
4	DO_SAT% (%)	90	90	79	80	105	89	101	103	86	72	66	98	N	N	N	N	I	I	I	I	114	95	105	102	I	I	I	I	I	I	I	I	91	67	131	88
5	FCol-MPN (MPN/100mL)										840	13110	505	D	D	D	D	T	T	T	T	91	3100	220	33	T	T	T	T	T	T	T	T	2200	400	20	78
6	Tcol-MPN (MPN/100mL)										11450	39760	1045	I	I	I	I	I	I	I	I	17445	28250	815	1995	I	I	I	I	I	I	I	I	24000	24000	80	230
	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	0.03	I	I	I	I	N	N	N	N					N	N	N	N	N	N	N	N				
	CHEMICAL INDICES													O	O	O	O	/	/	/	/	0.03	0.02	0.03	0.02	/	/	/	/	/	/	/	/	0.02	0.02	0.04	0.02
1	HAR_Ca (mgCaCO3/L)	76	58	94	114	100	84	76	120	94	130	72	94	N	N	N	N																				
2	HAR_Total (mgCaCO3/L)	100	84	135	167	153	119	115	169	137	183	129	163					R	R	R	R	126	123	120	100	R	R	R	R	R	R	R	R	136	121	108	96
3	Na% (%)	30	22	36	42	38	40	23	22	30	32	28	36					D	D	D	D	177	193	171	171	D	D	D	D	D	D	D	D	169	193	157	147
4	SAR (-)	0.9	0.6	1.3	1.9	1.5	1.5	0.7	0.7	1.0	1.3	1.0	1.4									38	45	34	37									40	46	37	35
	PESTICIDES																					1.6	2.3	1.4	1.5									1.8	2.4	1.5	1.4

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	38.03	37.90	48.73	277.5	29.98	25.85	18.45	17.40	18.25	19.55	19.61	20.91
2	Colour_Cod (-)	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Light Brown	Brown	Light Brown	Brown	Other
3	EC_FLD (µmho/cm)	2150	2090	2600	461	1514	1581	2050	2200	2420	1920	2380	2300
4	EC_GEN (µmho/cm)	2278	2496	2408	444	1814	1952	2101	2496	2548	2232	2820	2390
5	Odour_Code (-)	other-dis-agreeable	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-agreeable	other-dis-agreeable
6	pH_FLD (pH units)	7.1	7.0	7.2	6.9	7.1	7.1	7.0	7.2	7.2	7.2	7.1	7.0
7	pH_GEN (pH units)	8.3	8.2	8.3	7.6	7.8	7.9	8.3	7.9	8.0	8.0	8.3	8.3
8	SS (mg/L)	75	125	54	74	118	124	122	72	97	151	127	160
9	TDS (mg/L)	1507	1672	1632	280	1198	1288	1398	1648	1757	1516	1877	1601
10	Temp (deg C)	31.0	29.0	26.0	24.0	25.0	20.0	17.0	18.0	13.0	18.0	23.0	28.0
11	Turb (NTU)	29.0	18.0	10.0	63.0	20.0	22.0	10.0	14.0	42.0	17.0	61.0	29.0
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	5.0	0.0	1.7	0.0	0.0	0.0	5.8	0.0	0.0	0.0	4.2	5.8
2	ALK-TOT (mgCaCO3/L)	466	492	412	124	232	284	335	440	416	344	504	424
3	Ca (mg/L)	134	156	139	38	72	80	95	129	120	115	160	145
4	Cl (mg/L)	478.0	470.0	450.0	44.0	330.0	356.0	520.0	630.0	660.0	540.0	750.0	590.0
5	CO3 (mg/L)	6.0	0.0	2.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	5.0	7.0
6	F (mg/L)	0.59	0.69	0.73	0.68	0.59	0.80	0.57	0.57	0.67	0.72	0.68	0.98
7	Fe (mg/L)	0.5	0.5	0.5	0.5	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.4
8	HCO3 (mg/L)	556	600	498	151	283	346	395	537	508	420	605	503
9	K (mg/L)	26.1	19.8	27.0	4.5	16.2	19.8	23.4	24.7	24.0	11.1	17.6	17.0
10	Mg (mg/L)	21.9	19.4	19.0	13.9	43.7	40.8	32.3	31.6	35.2	26.7	32.8	31.8
11	Na (mg/L)	368.2	357.8	347.4	32.0	212.0	259.0	403.5	489.6	509.0	385.8	576.0	441.6
12	NH3-N (mg N/L)	26.20	28.05	26.20	1.39	16.30	23.20	29.60	27.85	29.80	24.80	34.10	34.70
13	NO2+NO3 (mg N/L)	1.58	1.65	1.72	1.42	2.51	2.10	2.17	2.12	2.50	1.97	2.26	1.24
14	NO2-N (mgN/L)	0.07	0.04	0.05	0.09	0.06	0.06	0.39	0.03	0.63	0.60	0.08	0.22
15	NO3-N (mgN/L)	1.51	1.61	1.67	1.33	2.45	2.04	1.78	2.09	1.87	1.37	2.18	1.02
16	P-Tot (mgP/L)	0.070	0.250	0.270	0.160	0.170	0.180	0.160	1.620	0.170	0.150	0.190	0.160
17	SiO2 (mg/L)	34.3	31.1	38.9	21.7	38.3	40.4	42.3	18.5	44.2	43.4	67.5	56.1
18	SO4 (mg/L)	13.0	68.1	78.8	24.4	87.1	91.3	96.4	108.5	100.4	98.8	116.1	107.9
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	15.8	31.6	24.7	2.6	21.8	22.4	24.5	37.6	27.5	17.4	28.8	30.2
2	COD (mg/L)	150.0	162.0	119.0	11.0	97.0	104.0	112.0	144.0	163.0	124.0	158.0	120.0
3	DO (mg/L)	0.1	0.0	0.0	3.1	0.9	0.5	0.0	0.0	0.0	1.0	0.0	0.0
4	DO_SAT% (%)	1	0	0	36	10	5	0	0	0	11	0	0
5	FCol-MPN (MPN/100mL)	4500	4500	22000	9200	34000	47000	40000	47000	23000	49000	*13	2000
6	Tcol-MPN (MPN/100mL)	7800	17000	49000	16000	79000	170000	170000	220000	33000	79000	*79	17000
	TRACE & TOXIC												
1	Al (mg/L)	0.10	0.07	0.10	0.06	0.06	0.07	0.07	0.08	0.08	0.07	0.10	0.08
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	335	391	348	96	179	199	237	323	301	288	401	363
2	HAR_Total (mgCaCO3/L)	426	472	427	154	362	369	372	455	447	399	537	495
3	Na% (%)	64	61	62	30	55	59	69	69	70	67	69	65
4	RSC (-)	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	SAR (-)	7.8	7.2	7.3	1.1	4.9	5.9	9.1	10.0	10.5	8.4	10.8	8.7
	PESTICIDES												
	Remarks											* low coliform values may be due to chlorination	

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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	1.35	2.96	2.00	0.750
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	0.65	0.45	0.00	5.80
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	0.37	11.65	5.00	0.00
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	0.70	5.11	12.00	19.50
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	-	-	-	-	0.373
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	0.74	12.88	32.0	23.30
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	0.53	2.15	0.00	15.00
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	0.74	10.30	29.0	19.94
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 : 2016-2017

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	1499	8.458	51.67
2	EC_FLD (µmho/cm)	12	2600	461	1972
3	EC_GEN (µmho/cm)	12	2820	444	2165
4	pH_FLD (pH units)	12	7.2	6.9	7.1
5	pH_GEN (pH units)	12	8.3	7.6	8.1
6	SS (mg/L)	12	160	54	108
7	TDS (mg/L)	12	1877	280	1448
8	Temp (deg C)	12	31.0	13.0	22.7
9	Turb (NTU)	12	63.0	10.0	27.9
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	5.8	0.0	1.9
2	ALK-TOT (mgCaCO3/L)	12	504	124	373
3	Ca (mg/L)	12	160	38	115
4	Cl (mg/L)	12	750.0	44.0	484.8
5	CO3 (mg/L)	12	7.0	0.0	2.3
6	F (mg/L)	12	0.98	0.57	0.69
7	Fe (mg/L)	12	0.5	0.2	0.4
8	HCO3 (mg/L)	12	605	151	450
9	K (mg/L)	12	27.0	4.5	19.3
10	Mg (mg/L)	12	43.7	13.9	29.1
11	Na (mg/L)	12	576.0	32.0	365.2
12	NH3-N (mg N/L)	12	34.70	1.39	25.18
13	NO2+NO3 (mg N/L)	12	2.51	1.24	1.94
14	NO2-N (mgN/L)	12	0.63	0.03	0.19
15	NO3-N (mgN/L)	12	2.45	1.02	1.74
16	P-Tot (mgP/L)	12	1.620	0.070	0.296
17	SiO2 (mg/L)	12	67.5	18.5	39.7
18	SO4 (mg/L)	12	116.1	13.0	82.6
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	37.6	2.6	23.7
2	COD (mg/L)	12	163.0	11.0	122
3	DO (mg/L)	12	3.1	0.0	0.5
4	DO_SAT% (%)	12	36	0	5
5	FCol-MPN (MPN/100mL)	12	49000	13	23518
6	Tcol-MPN (MPN/100mL)	12	220000	79	71490
	TRACE & TOXIC				
1	Al (mg/L)	12	0.10	0.06	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	401	96	288
2	HAR_Total (mgCaCO3/L)	12	537	154	410
3	Na% (%)	12	70	30	62
4	RSC (-)	12	0.8	0.0	0.1
5	SAR (-)	12	10.8	1.1	7.6
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Sabarmati | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	86.43	39.72	19.91	87.95	22.67	17.03	18.96	50.28	14.77	55.92	33.86	30.19	19.99	13.87	44.72	34.73	30.76	16.85	14.19	11.73	15.85	29.06	14.72	12.24	20.02
2	EC_FLD (µmho/cm)	1512	1056	995	1760	1472	1670	1536	1596	1357	1873	1737	1763	2030	1888	1618	2089	2181	2048	2102	2398	1897	2329	2248	2063	2693	1668	1334	1641	2521	2797	2460	2459	2570	2583	2437	2200
3	EC_GEN (µmho/cm)	1557	1088	987	1865	1556	1859	1665	1492	1355	1628	1767	1888	1927	1844	1710	2001	2174	2330	1911	2542	1919	1993	2327	2274	2689	1652	1424	1832	2568	3207	2200	2486	2445	2652	2382	2481
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		7.1	7.6	7.5	7.2	7.8	7.8	8.0	8.2	8.2	7.8	7.7	8.3	7.1	7.7	7.4	7.3	7.9	7.9	8.3	7.9	8.3	8.0		7.1	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	8.0	7.7	7.7	7.7	8.0	7.9	8.1	7.7	8.0	7.9	8.0	8.2	8.0	7.9	7.7	7.7	7.8	7.8	7.7	8.1	8.2	8.2	8.3	8.2	8.2
6	SS (mg/L)	137	119	36	60	110	121	98	86	146	183	217	89	32	71	72	88	113	245	78	93	189	116	152	104	43	69	36	72	127	103	96	83	207	185	85	146
7	TDS (mg/L)	1074	749	657	1262	1040	1264	1079	1036	906	1100	1108	1258	1365	1170	1096	1351	1450	1579	1303	1739	1280	1301	1567	1523	1881	1099	957	1250	1750	2233	1479	1783	1655	1748	1589	1665
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	27.0	23.9	26.8	25.2	24.9	25.1	25.7	24.8	23.2	23.8	18.7	20.8	17.0	30.9	31.2	30.8	33.0	33.1	32.7	29.1	30.9	29.3	25.3	25.3	23.0
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	28.0	8.0	16.3	16.5	16.8	23.0	23.5	16.0	21.3	33.0	30.3	41.5	22.0	13.3	13.3	12.7	19.3	50.0	42.7	29.3	42.7	42.3	25.3	10.0	35.7
	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	1.3	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	1.5	1.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.9	9.4	1.9	3.3
2	ALK-TOT (mgCaCO3/L)	335	279	292	498	361	356	316	320	322	291	264	345	411	340	340	630	401	430	388	485	348	332	367	369	449	291	405	542	484	553	393	536	391	462	409	424
3	Ca (mg/L)	48	46	45	87	100	129	108	108	115	90	85	108	58	59	61	117	136	157	145	163	98	112	121	106	75	49	65	108	176	175	149	186	117	141	131	140
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	354.4	292.7	259.8	192.0	370.5	381.5	459.5	370.5	484.5	348.3	342.8	431.3	541.5	273.3	267.3	214.7	312.0	490.0	614.7	441.3	488.7	438.7	436.7	448.7	626.7
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	1.6	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	1.8	1.8	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	2.3	11.3	2.3	4.0
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	0.66	0.69	0.85	0.81	0.88	0.65	0.87	0.66	0.68	0.78	0.49	0.83	0.65	0.85	0.79	0.83	0.61	0.86	0.93	0.80	0.52	0.70	0.74	0.70	0.79
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	0.4	0.0	0.0	0.2	0.8	1.2	0.9	0.5	0.5	0.6	0.4	0.4	0.3	0.0	0.1	0.2	1.0	1.1	1.0	0.4	0.4	0.7	0.4	0.4	0.4
8	HCO3 (mg/L)	204	170	178	304	300	434	385	390	393	349	310	418	251	208	207	384	488	523	474	592	425	405	444	447	274	177	247	330	590	675	480	654	472	540	495	509
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	18.7	10.0	12.0	6.9	9.5	14.2	13.3	6.3	9.5	9.7	6.3	22.9	23.0	12.0	10.9	7.2	15.7	14.8	17.2	7.7	9.3	11.7	9.0	21.0	15.2
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	23.6	16.7	19.1	13.8	20.9	19.9	19.4	17.5	25.8	23.8	31.3	24.9	35.0	18.1	19.4	18.5	17.2	27.5	29.2	22.4	28.5	22.7	53.9	22.8	30.5
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	263.5	221.7	187.0	142.7	272.2	290.2	329.0	285.0	368.2	265.5	242.8	313.6	415.3	205.0	191.2	153.9	231.2	332.9	448.7	323.1	357.8	326.6	300.2	343.9	467.8
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	19.63	26.10	19.88	20.94	23.47	24.15	18.94	13.57	30.78	22.76	20.72	22.11	27.61	24.70	19.19	16.55	20.83	26.32	16.12	34.15	29.28	36.42	35.48	27.78	31.20
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	1.78	0.12	1.79	2.44	3.40	2.68	1.37	2.49	2.12	1.90	1.81	1.57	2.22	0.23	2.35	1.69	4.34	2.95	1.74	2.38	2.49	3.93	2.43	1.79	1.82
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	0.06	0.03	0.14	0.02	0.08	0.02	0.05	0.04	0.07	0.03	0.33	0.03	0.28	0.01	0.08	0.02	0.10	0.03	0.07	0.10	0.06	0.06	0.17	0.24	0.30
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	1.71	0.09	1.64	2.42	3.32	2.66	1.32	2.45	2.05	1.87	1.49	1.54	1.94	0.21	2.27	1.67	4.24	2.92	1.68	2.29	2.43	3.87	2.26	1.55	1.52
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	0.184	1.443	2.645	0.247	0.200	0.198	0.185	0.252	0.290	0.265	0.225	0.232	0.533	1.767	0.780	0.133	0.270	0.190	0.247	0.270	0.257	0.283	0.263	0.247	0.167
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	32.9	23.6	29.4	36.9	38.7	36.1	43.6	44.3	25.6	37.3	36.6	35.5	36.3	22.3	33.9	34.8	39.9	36.6	54.5	45.5	39.1	39.6	40.5	46.9	55.7
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	54.3	84.0	82.0	69.7	112.0	100.3	93.0	121.7	128.8	51.5	79.5	74.2	99.2	93.6	78.7	57.2	119.3	92.7	116.3	125.6	120.8	56.3	95.8	73.4	107.6
	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	19.3	13.7	11.8	35.0	13.5	13.3	25.8	18.0	23.5	28.9	35.8	45.5	28.0	18.3	11.3	35.0	24.0	25.0	18.0	22.3	23.3	36.0	28.9	22.7	25.5
2	COD (mg/L)										120.6	101.4	107.8									139.3	298.1	110.7	130.8								1073.2	535.1	116.0	134.0
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	0.8	7.1	5.7	6.7	5.4	6.7	6.5	7.0	0.1	1.8	0.6	0.0	0.1	6.0	6.9	6.7	6.1	5.7	6.1	0.0	0.0	0.1	0.0	0.1	0.3
4	DO_SAT% (%)	66	74	79	86	90	89	78	12	32	12	33	10	83	70	81	64	80	79	84	1	23	8	0	1	80	92	89	84	79	84	0	0	2	0	1	4
5	FCol-MPN (MPN/100mL)										3658	1362	14840									122	3175	8208	39250								5100	937	7833	17004
6	Tcol-MPN (MPN/100mL)										35100	18724	33760									9713	32800	13125	148250								16101	16860	20000	32026
	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	0.08	0.05	0.04	0.06	0.04	0.07	0.05	0.05	0.06	0.06	0.05	0.07	0.07	0.03	0.05	0.07	0.03	0.07	0.06	0.05	0.05	0.08	0.06	0.08	0.08
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	120	116	113	217	249	323	269	269	288	224	212	270	146	148	152	292	340	393	362	408	245	281	303	265	187	122	162	270	440	437	373	465	291	352	327	351
2	HAR_Total (mgCaCO3/L)	182	177	175	288	351	404	341	354	374	315	352	368	216	227	210	379	423	474	435	515	345	411	407	411	262	203	239	341	554	558	466	584	386	576	422	477
3	Na% (%)	57	49	51	62	53	55	47	57	41	52	49	54	68	63	58	60	59	59	58	60	62	54	61	67	62	65	57	58	56	63	60	57	64	53	63	67
4	RSC (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.3	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	0.0	0.6	0.0	0.0	0.2	0.0	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	5.7	6.6	5.4	4.3	6.0	6.1	6.6	5.9	7.1	6.2	5.1	6.8	8.9	5.5	5.9	4.3	5.5	6.1	8.3	6.5	6.4	7.2	5.5	7.3	9.3
	PESTICIDES																																				

4. BANAS BASIN

4.0 Banas Basin

4.1 Basin description

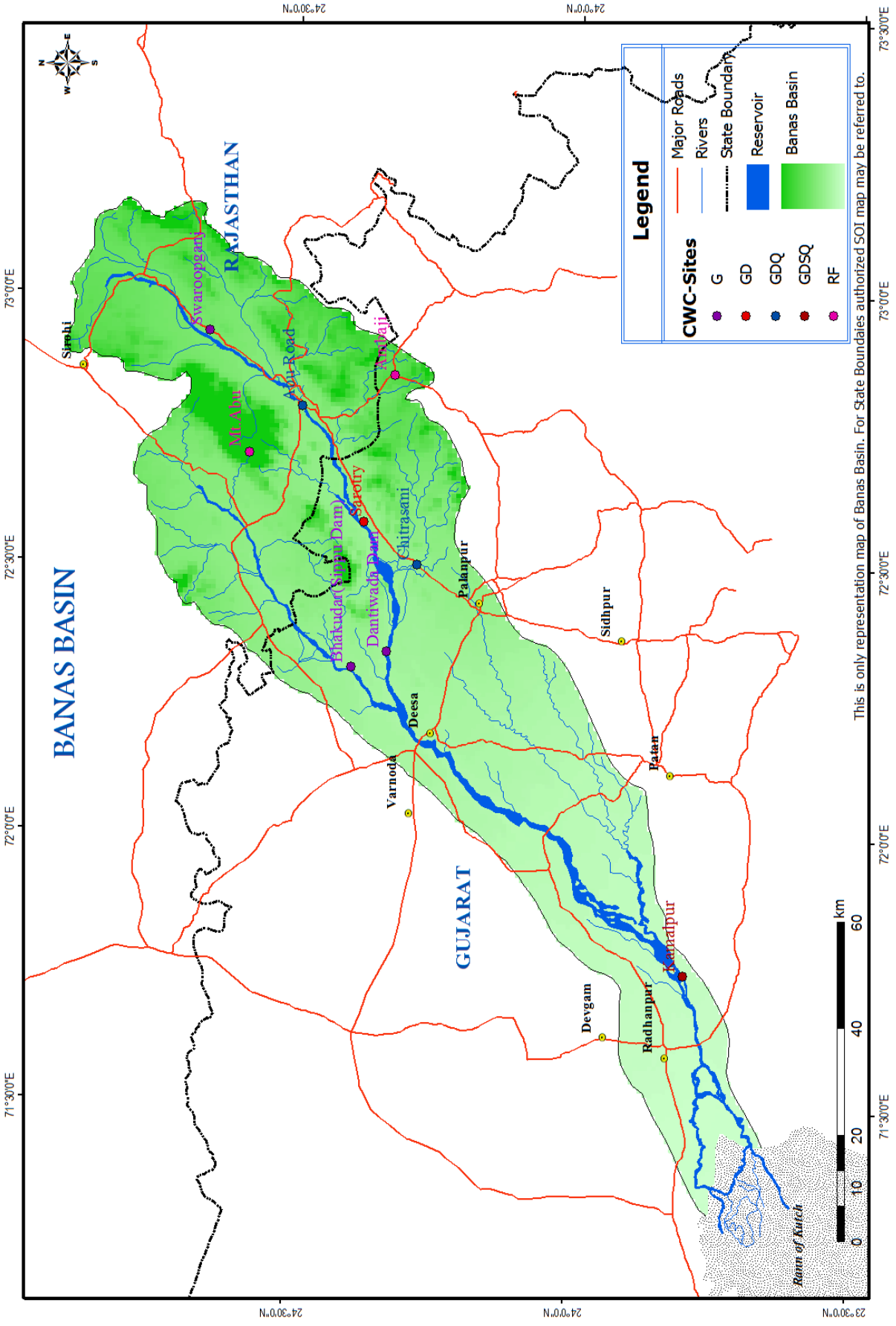
The Banas river rises near Pindwara village in Sirohi district of Rajasthan at an elevation of 372.5 m above mean sea level. Its basin map is enclosed. The total length of the river from origin to its outfall into the little Rann of Kutch. It drains an area of 8,674 sq km out of which nearly 38 % lies 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.

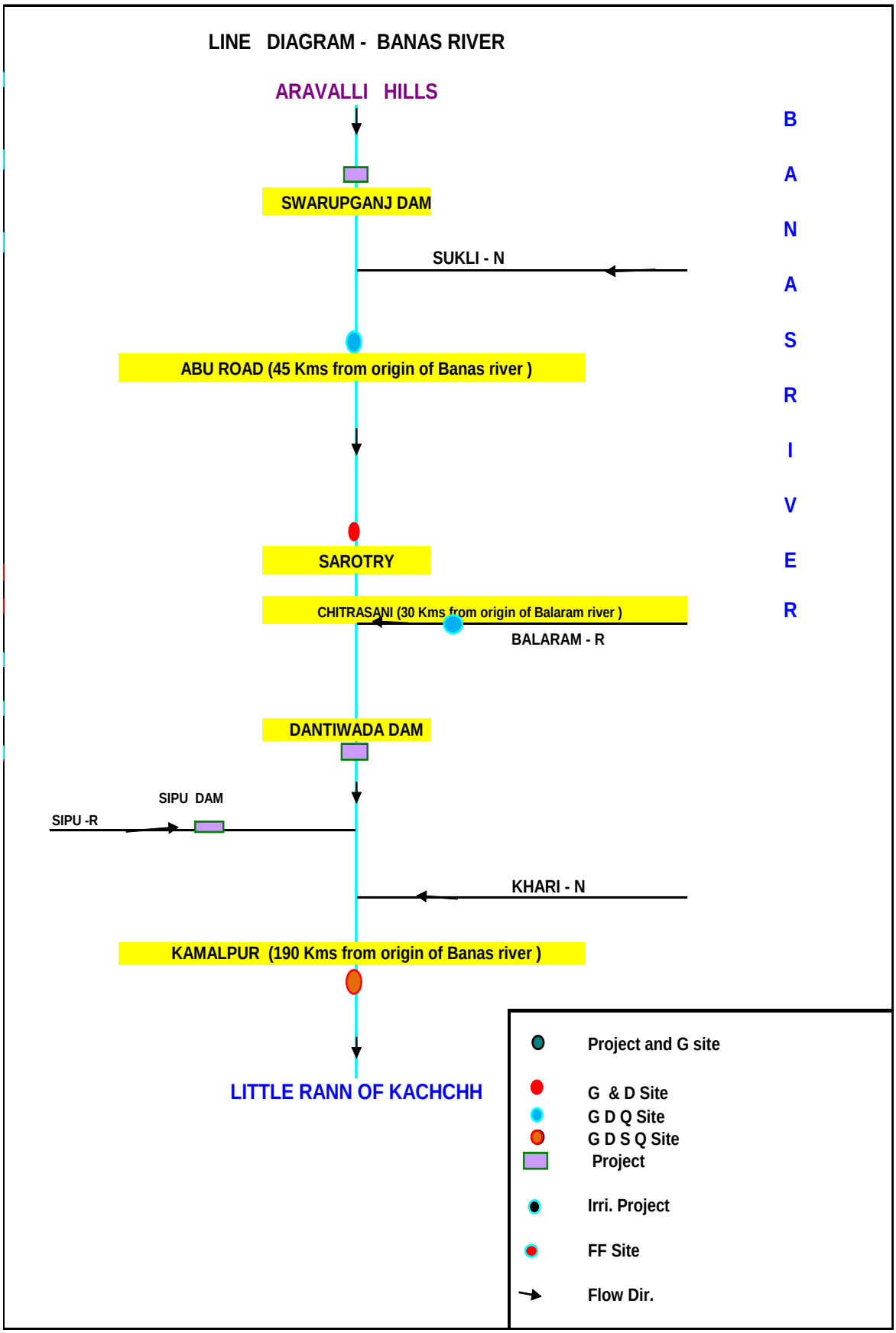
The number of principal tributaries, which contribute significantly, is seven. Sipu is the only major tributary on the right bank. The other six tributaries namely Batria, Sukli, Sewaran, Suket, Balaram and Khari drain into the main channel from left bank. Hence draining system on the left bank of the 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
Major Roads
Rivers
State Boundary
Reservoir
Banas Basin
CWC-Sites
G
GD
GDQ
GDSQ
RF
Sirohi
Swaroopganj
Abu Road
Mt.Abu
Palanpur
Sidhpur
Deesa
Varnoda
Patan
Devgam
Radhanpur
Kandlapur
Rann of Kutch
km
0 10 20 40 60
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	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)		0.450	2.256	15.80	0.660	0.450	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)			Clear		Clear		Clear					
3	EC_FLD (µmho/cm)			420		800		850					
4	EC_GEN (µmho/cm)			361		608		954					
5	Odour_Code (-)			odour free		odour free		odour free					
6	pH_FLD (pH units)			7.7		8.6		8.3					
7	pH_GEN (pH units)			8.4		8.3		8.4					
8	SS (mg/L)			24		62		60					
9	TDS (mg/L)			228		386		620					
10	Temp (deg C)			27.0				18.0					
11	Turb (NTU)			5.0		4.0		4.0					
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			8.3		10.0		11.6					
2	ALK-TOT (mgCaCO3/L)			121		164		255					
3	Ca (mg/L)			46		48		74					
4	Cl (mg/L)			34.0		66.0		114.0					
5	CO3 (mg/L)			10.0		12.0		14.0					
6	F (mg/L)		O	0.94	O	0.50	O	0.92	O		O		O
7	Fe (mg/L)		N	0.0	N	0.1	N	0.1	N		N		N
8	HCO3 (mg/L)	R	C	127	C	176	C	283	C	R	C	R	C
9	K (mg/L)	I	E	0.9	E	1.2	E	7.3	E	I	E	I	E
10	Mg (mg/L)	V		8.8		19.4		23.3		V		V	
11	Na (mg/L)	E	I	23.7	I	44.5	I	87.4	I	E	I	E	I
12	NH3-N (mg N/L)	R	N	0.31	N	1.08	N	1.25	N	R	N	R	N
13	NO2+NO3 (mg N/L)			2.83		1.88		3.94					
14	NO2-N (mgN/L)		2	0.04	2	0.03	2	0.07	2		2		2
15	NO3-N (mgN/L)	D	M	2.79	M	1.85	M	3.87	M	D	M	D	M
16	P-Tot (mgP/L)	R	O	0.090	O	0.090	O	0.080	O	R	O	R	O
17	SiO2 (mg/L)	Y	N	21.0	N	24.2	N	29.0	N	Y	N	Y	N
18	SO4 (mg/L)		T	18.4	T	16.9	T	21.2	T		T		T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			2.3		3.2		3.5					
2	COD (mg/L)			11.0		8.0		10.0					
3	DO (mg/L)			8.3		9.8		9.6					
4	DO_SAT% (%)			105				101					
5	FCol-MPN (MPN/100mL)			260		45		68					
6	Tcol-MPN (MPN/100mL)			700		140		140					
	TRACE & TOXIC												
1	Al (mg/L)			0.04		0.03		0.03					
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			116		119		184					
2	HAR_Total (mgCaCO3/L)			153		200		282					
3	Na% (%)			25		33		40					
4	RSC (-)			0.0		0.0		0.0					
5	SAR (-)			0.8		1.4		2.3					
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
1	As	Arsenic	microgram / l							0.58				9.68			1.23	1.396		-				1.63				2.00		
2	Cd	Cadmium	microgram / l							0.029				0.12			0.13	0.00		0.205				0.00				0.02		
3	Cr	Chromium	microgram / l							2.64				4.07			10.22	0.00		14.46				3.68				1.27		
4	Cu	Copper	microgram / l							4.76				9.86			10.41	-		22.69				0.74				4.99		
5	Hg	Mercury	microgram / l							0.56				-			0.23	0.154		-				-				-		
6	Ni	Nickel	microgram / l							-				11.28			9.49	0.00		0.20				0.46				4.92		
7	Pb	Lead	microgram / l							1.440				1.030			4.92	96.30		1.59				0.68				1.7		
8	Zn	Zinc	microgram / l							14.35				14.16			7.00	19.80		16.00				5.00				4.50		
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 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							-				-			-			-				-				-		

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 : 2016-2017

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)	327	59.27	0.000	2.013
2	EC_FLD (µmho/cm)	3	850	420	690
3	EC_GEN (µmho/cm)	3	954	361	641
4	pH_FLD (pH units)	3	8.6	7.7	8.2
5	pH_GEN (pH units)	3	8.4	8.3	8.4
6	SS (mg/L)	3	62	24	49
7	TDS (mg/L)	3	620	228	411
8	Temp (deg C)	2	27.0	18.0	22.5
9	Turb (NTU)	3	5.0	4.0	4.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	3	11.6	8.3	10
2	ALK-TOT (mgCaCO3/L)	3	255	121	180
3	Ca (mg/L)	3	74	46	56
4	Cl (mg/L)	3	114.0	34.0	71.3
5	CO3 (mg/L)	3	14.0	10.0	12
6	F (mg/L)	3	0.94	0.50	0.79
7	Fe (mg/L)	3	0.1	0.0	0.1
8	HCO3 (mg/L)	3	283	127	195
9	K (mg/L)	3	7.3	0.9	3.1
10	Mg (mg/L)	3	23.3	8.8	17.2
11	Na (mg/L)	3	87.4	23.7	51.9
12	NH3-N (mg N/L)	3	1.25	0.31	0.88
13	NO2+NO3 (mg N/L)	3	3.94	1.88	2.88
14	NO2-N (mgN/L)	3	0.07	0.03	0.05
15	NO3-N (mgN/L)	3	3.87	1.85	2.84
16	P-Tot (mgP/L)	3	0.090	0.080	0.087
17	SiO2 (mg/L)	3	29.0	21.0	24.7
18	SO4 (mg/L)	3	21.2	16.9	18.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	3	3.5	2.3	3
2	COD (mg/L)	3	11.0	8.0	9.7
3	DO (mg/L)	3	9.8	8.3	9.2
4	DO_SAT% (%)	2	105	101	103
5	FCol-MPN (MPN/100mL)	3	260	45	124
6	Tcol-MPN (MPN/100mL)	3	700	140	327
	TRACE & TOXIC				
1	Al (mg/L)	3	0.04	0.03	0.03
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	3	184	116	140
2	HAR_Total (mgCaCO3/L)	3	282	153	212
3	Na% (%)	3	40	25	32
4	RSC (-)	3	0.0	0.0	0
5	SAR (-)	3	2.3	0.8	1.5
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Banas | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	4.791	0.000	0.552	0.158	0.000	0.000	0.000	0.795	0.426	0.351	0.000	0.000	0.150	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	610									1035	1380	451	850									1580			
3	EC_GEN (µmho/cm)	219	462	734	721	453	425	513	733	433	523	541	485		1049					896		941	1259	1390	954									1729			
4	pH_FLD (pH units)									8.3	7.4	8.3	8.1									8.4	7.6	8.1	8.3									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	8.3		7.9					7.8		8.4	8.3	8.2	8.4									8.2			
6	SS (mg/L)	46	134	63	19	36	38	42	44	16	32	96	43	O	58	O	O	O	O	44	O	45	36	58	60	O	O	O	O	O	O	O		48			
7	TDS (mg/L)	152	323	488	463	286	260	329	470	285	340	347	307	N	645	N	N	N	N	580	N	605	860	918	620	N	N	N	N	N	N	N		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	27.0	C		C	C	C	C	17.0	E	16.5	20.0	14.0	18.0	C	C	C	C	C	C	C		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	4.5	E	6.5	E	E	E	E	17.0		4.5	4.0	1.0	4.0	E	E	E	E	E	E	E		5.0			
	CHEMICAL													I		I	I	I	I		I					I	I	I	I	I	I	I					
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	9.1	N	0.0	N	N	N	N	0.0	N	7.9	11.6	0.0	11.6	N	N	N	N	N	N	N		0.0			
2	ALK-TOT (mgCaCO3/L)	173	182	296	288	136	120	144	196	108	120	146	143		270					196		254	223	292	255									308			
3	Ca (mg/L)	30	27	55	49	46	42	51	71	30	42	41	47	2	36	2	2	2	2	77	2	67	68	109	74	2	2	2	2	2	2	2		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	50.0		89.0					112.0		175.0	322.0	176.0	114.0								O	345.0	O	O	O
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	11.0	M	0.0	M	M	M	M	0.0	M	9.5	14.0	0.0	14.0	M	M	M	M	M	M	M	O	0.0	N	N	N
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	0.72	O	0.85	O	O	O	O	1.02	O	0.72	0.81	0.56	0.92	O	O	O	O	O	O	O	N	1.11	C	C	C
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	0.1	N	0.0	N	N	N	N	0.2	N	0.2	0.3	0.2	0.1	N	N	N	N	N	N	N	C	0.3	E	E	E
8	HCO3 (mg/L)	106	111	181	176	166	146	176	239	132	137	168	152	T	165	T	T	T	T	239	T	291	244	356	283	T	T	T	T	T	T	T	E	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	1.0	H	1.7	H	H	H	H	2.7	H	1.9	0.8	1.8	7.3	H	H	H	H	H	H	H		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	14.1	/	10.2	/	/	/	/	15.6	/	21.4	34.5	18.2	23.3	/	/	/	/	/	/	/	I	17.5	I	I	I
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	34.1		69.0					86.1		131.3	243.4	118.6	87.4								N	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	0.70	P		P	P	P	P	0.25	P	0.46	0.34	0.22	1.25	P	P	P	P	P	P	P	2	0.75	2	2	2
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	2.35	O	0.47	O	O	O	O	4.54	O	2.14	4.19	2.61	3.94	O	O	O	O	O	O	O		1.34	M	M	M
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	0.03	O	0.06	O	O	O	O	0.02	O	0.08	0.16	0.05	0.07	O	O	O	O	O	O	O	M	0.11	O	O	O
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	2.32	L	0.41	L	L	L	L	4.52	L	2.06	4.03	2.56	3.87	L	L	L	L	L	L	L	O	1.23	N	N	N
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	0.090	I	0.045	I	I	I	I	0.120	I	0.095	0.130	0.140	0.080	I	I	I	I	I	I	I	N	0.120	T	T	T
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	22.6	N	25.9	N	N	N	N	26.7	N	22.3	22.5	32.6	29.0	N	N	N	N	N	N	N	T	20.6	H	H	H
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	G	17.7	G	G	G	G	44.8	G	13.3	74.0	21.6	21.2	G	G	G	G	G	G	G	H	15.1	/	/	/
	BIOLOGICAL/BACTERIOLOGICAL													C		C	C	C	C		C					C	C	C	C	C	C	C					
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	2.7	O	0.7	O	O	O	O	0.7	O	1.9	4.2	3.4	3.5	O	O	O	O	O	O	O		1.0			
2	COD (mg/L)										53.6	87.0	9.5	N		N	N	N	N		N	135.7	61.4	20.0	10.0	N	N	N	N	N	N	N	R	52.6	R	R	R
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	9.1	D	9.3	D	D	D	D	8.2	D	8.7	9.3	8.9	9.6	D	D	D	D	D	D	D	D	6.3	D	D	D
4	DO_SAT% (%)	66	70	85	82	53	108	88	104	100	71	129	105	I		I	I	I	I	85	I	89	102	86	101	I	I	I	I	I	I	I		69			
5	FCol-MPN (MPN/100mL)										2500	110	153	T		T	T	T	T		T	56	5800	20	68	T	T	T	T	T	T	T		79			
6	Tcol-MPN (MPN/100mL)										18100	920	420	I		I	I	I	I		I	17259	49000	170	140	I	I	I	I	I	I	I		14100			
	TRACE & TOXIC													O		O	O	O	O		O					O	O	O	O	O	O	O					
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	N	0.03	N	N	N	N	0.06	N	0.04	0.06	0.05	0.03	N	N	N	N	N	N	N		0.05			
	CHEMICAL INDICES													/		/	/	/	/		/					/	/	/	/	/	/	/					
1	HAR_Ca (mgCaCO3/L)	76	67	136	122	116	104	126	176	74	106	102	118		89					192		168	170	274	184									281			
2	HAR_Total (mgCaCO3/L)	98	94	211	183	161	133	167	229	125	147	174	176	R	132	R	R	R	R	257	R	257	314	349	282	R	R	R	R	R	R	R		353			
3	Na% (%)	24	34	34	40	39	36	32	35	50	45	32	29	D	53	D	D	D	D	42	D	52	63	42	40	D	D	D	D	D	D	D		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	0.0		0.1					0.0		0.2	0.0	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	1.1		2.6					2.3		3.5	6.0	2.8	2.3									5.3			
	PESTICIDES																																				

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	6.799	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)					Clear		Clear		Clear			
3	EC_FLD (µmho/cm)					650		660		660			
4	EC_GEN (µmho/cm)					627		676		706			
5	Odour_Code (-)					odour free		odour free		odour free			
6	pH_FLD (pH units)					8.4		8.7		8.9			
7	pH_GEN (pH units)					7.9		8.5		8.2			
8	SS (mg/L)					54		52		61			
9	TDS (mg/L)					402		432		456			
10	Temp (deg C)					22.0		15.0		12.0			
11	Turb (NTU)					1.0		5.0		1.0			
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)					0.0		14.1		0.0			
2	ALK-TOT (mgCaCO3/L)					180		220		212			
3	Ca (mg/L)					67		68		73			
4	Cl (mg/L)		O		O	60.0	O	90.0	O	94.0	O		O
5	CO3 (mg/L)		N		N	0.0	N	17.0	N	0.0	N		N
6	F (mg/L)		C		C	0.49	C	0.57	C	0.62	C		C
7	Fe (mg/L)	R	E	R	E	0.1	E	0.2	E	0.2	E	R	E
8	HCO3 (mg/L)	I		I		220		234		259		I	
9	K (mg/L)	V		V		1.3		3.3		3.4		V	
10	Mg (mg/L)	E	I	E	I	13.6	I	16.0	I	14.8	I	E	I
11	Na (mg/L)	R	N	R	N	38.3	N	69.5	N	65.3	N	R	N
12	NH3-N (mg N/L)					0.15		0.77		0.94			
13	NO2+NO3 (mg N/L)		2		2	0.72	2	0.40	2	0.46	2		2
14	NO2-N (mgN/L)					0.02		0.04		0.05			
15	NO3-N (mgN/L)	D	M	D	M	0.70	M	0.36	M	0.41	M	D	M
16	P-Tot (mgP/L)	R	O	R	O	0.070	O	0.070	O	0.080	O	R	O
17	SiO2 (mg/L)	Y	N	Y	N	30.4	N	30.4	N	30.8	N	Y	N
18	SO4 (mg/L)		T		T	17.4	T	18.2	T	19.4	T		T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)					1.7		1.6		1.4			
2	COD (mg/L)					5.0		4.0		3.0			
3	DO (mg/L)					5.2		7.8		8.3			
4	DO_SAT% (%)					59		77		77			
5	FCol-MPN (MPN/100mL)					140		20		78			
6	Tcol-MPN (MPN/100mL)					270		45		700			
	TRACE & TOXIC												
1	Al (mg/L)					0.06		0.05		0.06			
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)					167		170		183			
2	HAR_Total (mgCaCO3/L)					224		237		245			
3	Na% (%)					27		39		36			
4	RSC (-)					0.0		0.0		0.0			
5	SAR (-)					1.1		2.0		1.8			
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
1	As	Arsenic	microgram / l							0.52				9.30			2.13			-	-			0.18	0.799	0.51	1.45	2.14		
2	Cd	Cadmium	microgram / l							0.043				0.13			0.144			0.041	0.06			0.01	0.00	0.88	0.15	0.02		
3	Cr	Chromium	microgram / l							7.17				4.22			6.41			9.56	0.54			3.25	0.00	6.22	0.41	3.42		
4	Cu	Copper	microgram / l							7.81				10.37			20.03			9.23	4.06			0.79	-	3.72	6.68	2.49		
5	Hg	Mercury	microgram / l							0.46				-		P	0.19			-	-			-	0.00	-	-	-		
6	Ni	Nickel	microgram / l							-				3.67	O	O	11.32			0.97	0.26			0.72	1.80	1.88	0.90	5.28		
7	Pb	Lead	microgram / l							1.890				5.110	N C	O L	3.54			0.50	15.46			0.39	0.00	3.42	0.85	1.33		
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	8.10	R I V E R	R I V E R	R I V E R	BDL	E I N 2 M O N T H	I N G C O N D I T I O N	3.00	R I V E R	R I V E R	6.00	9.40	R I V E R	R I V E R	4.90	0.54	3.50	0.90	1.70	R I V E R	R I V E R
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	D R Y	-	-	D R Y	D R Y	-	-	-	-	-	D R Y	D R Y
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 : 2016-2017

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)	361	28.28	0.000	0.423
2	EC_FLD (µmho/cm)	3	660	650	657
3	EC_GEN (µmho/cm)	3	706	627	670
4	pH_FLD (pH units)	3	8.9	8.4	8.7
5	pH_GEN (pH units)	3	8.5	7.9	8.2
6	SS (mg/L)	3	61	52	56
7	TDS (mg/L)	3	456	402	430
8	Temp (deg C)	3	22.0	12.0	16.3
9	Turb (NTU)	3	5.0	1.0	2.3
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	3	14.1	0.0	4.7
2	ALK-TOT (mgCaCO3/L)	3	220	180	204
3	Ca (mg/L)	3	73	67	69
4	Cl (mg/L)	3	94.0	60.0	81.3
5	CO3 (mg/L)	3	17.0	0.0	5.7
6	F (mg/L)	3	0.62	0.49	0.56
7	Fe (mg/L)	3	0.2	0.1	0.2
8	HCO3 (mg/L)	3	259	220	238
9	K (mg/L)	3	3.4	1.3	2.6
10	Mg (mg/L)	3	16.0	13.6	14.8
11	Na (mg/L)	3	69.5	38.3	57.7
12	NH3-N (mg N/L)	3	0.94	0.15	0.62
13	NO2+NO3 (mg N/L)	3	0.72	0.40	0.53
14	NO2-N (mgN/L)	3	0.05	0.02	0.04
15	NO3-N (mgN/L)	3	0.70	0.36	0.49
16	P-Tot (mgP/L)	3	0.080	0.070	0.073
17	SiO2 (mg/L)	3	30.8	30.4	30.5
18	SO4 (mg/L)	3	19.4	17.4	18.4
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	3	1.7	1.4	1.6
2	COD (mg/L)	3	5.0	3.0	4
3	DO (mg/L)	3	8.3	5.2	7.1
4	DO_SAT% (%)	3	77	59	71
5	FCol-MPN (MPN/100mL)	3	140	20	79
6	Tcol-MPN (MPN/100mL)	3	700	45	338
	TRACE & TOXIC				
1	Al (mg/L)	3	0.06	0.05	0.06
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	3	183	167	174
2	HAR_Total (mgCaCO3/L)	3	245	224	235
3	Na% (%)	3	39	27	34
4	RSC (-)	3	0.0	0.0	0
5	SAR (-)	3	2.0	1.1	1.6
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Balaram **River Water** **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	1.720	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	0.000	0.000
2	EC_FLD (µmho/cm)									535	580	570	650									695	820	770	660											800	
3	EC_GEN (µmho/cm)	241	610	522	736	567	410	466	505	540	549	452	627		702							825	677	706	691											733	
4	pH_FLD (pH units)									8.5	9.0	8.8	8.4									9.7	8.9	8.9	8.8											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	7.9		8.3							8.6	8.3	8.3	8.3											8.5	
6	SS (mg/L)	41	36	52	17	18	48	69	56	59	36	67	54	O	59	O	O	O	O	O	O	45	40	47	57	O	O	O	O	O	O	O				40	
7	TDS (mg/L)	165	380	317	465	368	254	296	318	359	350	290	402	N	427	N	N	N	N	N	N	538	413	459	444	N	N	N	N	N	N	N				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	22.0	C	427	C	C	C	C	C	C	538	413	459	444	C	C	C	C	C	C	C				483	
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	1.0	E	18.5	E	E	E	E	E	E	17.0	22.0	15.5	13.5	E	E	E	E	E	E	E				22.0	
	CHEMICAL													I	9.5	I	I	I	I	I	I	5.0	4.0	2.0	3.0	I	I	I	I	I	I	I				10.0	
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	0.0	N	1.7	N	N	N	N	N	N	13.7	5.0	5.0	7.1	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	180		241							231	208	200	216											220	
3	Ca (mg/L)	29	31	39	52	30	34	49	55	47	55	51	67	2	33	2	2	2	2	2	2	63	58	77	71	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	60.0		69.0							134.0	82.0	78.0	92.0											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	0.0	M	2.0	M	M	M	M	M	M	16.5	6.0	6.0	8.5	M	M	M	M	M	M	M	O	O	O	12.0	O
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	0.49	O	0.77	O	O	O	O	O	O	0.72	0.88	0.61	0.59	O	O	O	O	O	O	O	N	N	N	0.94	N
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	0.1	N	0.0	N	N	N	N	N	N	0.2	0.2	0.1	0.2	N	N	N	N	N	N	N	C	C	C	0.2	C
8	HCO3 (mg/L)	100	142	149	186	190	139	176	190	186	188	149	220	T	145	T	T	T	T	T	T	249	242	232	247	T	T	T	T	T	T	T	E	E	E	244	E
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	1.3	H	1.5	H	H	H	H	H	H	1.9	0.8	1.3	3.3	H	H	H	H	H	H	H				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	13.6	/	9.7	/	/	/	/	/	/	21.4	28.2	11.5	15.4	/	/	/	/	/	/	/	I	I	I	14.1	I
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	38.3		53.0							103.6	56.0	53.9	67.4								N	N	N	61.2	N
12	NH3-N (mg N/L)			0.05	0.28	0.46	0.54	0.30	0.07	0.46	0.13	0.33	0.15	P	0.05	P	P	P	P	P	P	0.40	0.14	0.39	0.85	P	P	P	P	P	P	P	2	2	2	0.35	2
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	0.72	O	0.21	O	O	O	O	O	O	0.88	0.81	2.26	0.43	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	0.02	O	0.03	O	O	O	O	O	O	0.01	0.01	0.02	0.04	O	O	O	O	O	O	O	M	M	M	0.01	M
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	0.70	L	0.18	L	L	L	L	L	L	0.87	0.80	2.25	0.39	L	L	L	L	L	L	L	O	O	O	1.47	O
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	0.070	I	0.020	I	I	I	I	I	I	0.075	0.060	0.075	0.075	I	I	I	I	I	I	I	N	N	N	0.090	N
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	30.4	N	19.4	N	N	N	N	N	N	31.4	24.2	27.5	30.6	N	N	N	N	N	N	N	T	T	T	35.7	T
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	17.4	G	17.4	G	G	G	G	G	G	16.6	29.5	19.1	18.8	G	G	G	G	G	G	G	H	H	H	20.6	H
	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	1.7	C	0.8	C	C	C	C	C	C	2.5	1.0	1.3	1.5	C	C	C	C	C	C	C				1.9	
2	COD (mg/L)										59.8	34.4	5.0	O		O	O	O	O	O	O	126.6	18.1	5.5	3.5	O	O	O	O	O	O	O	R	R	R	3.0	R
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	5.2	N	9.8	N	N	N	N	N	N	10.8	7.3	8.2	8.0	N	N	N	N	N	N	N	D	D	D	6.4	D
4	DO_SAT% (%)	76	74	112	93	91	105	110	114	115	85	77	59	D	105	D	D	D	D	D	D	113	84	82	77	D	D	D	D	D	D	D				73	
5	FCol-MPN (MPN/100mL)										790	280	140	I		I	I	I	I	I	I	56	2550	2	49	I	I	I	I	I	I	I				20	
6	Tcol-MPN (MPN/100mL)										17100	490	270	T		T	T	T	T	T	T	27140	17500	85	373	T	T	T	T	T	T	T				130	
	TRACE & TOXIC													I		I	I	I	I	I	I					I	I	I	I	I	I	I					
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	0.06	O	0.04	O	O	O	O	O	O	0.06	0.04	0.06	0.05	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	167	/	83	/	/	/	/	/	/	158	144	193	177	/	/	/	/	/	/	/				190	
2	HAR_Total (mgCaCO3/L)	94	119	147	177	169	121	159	181	193	203	173	224	R	124	R	R	R	R	R	R	247	262	241	241	R	R	R	R	R	R	R				249	
3	Na% (%)	23	49	39	42	41	37	33	31	31	28	28	27	D	48	D	D	D	D	D	D	47	32	33	37	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	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	1.1		2.1							2.9	1.5	1.5	1.9											1.7	
	PESTICIDES																																				

HISTORY SHEET

		Water Year	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	15.83	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)												
3	EC_FLD (µmho/cm)												
4	EC_GEN (µmho/cm)												
5	Odour_Code (-)												
6	pH_FLD (pH units)												
7	pH_GEN (pH units)												
8	SS (mg/L)												
9	TDS (mg/L)												
10	Temp (deg C)												
11	Turb (NTU)												
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)												
2	ALK-TOT (mgCaCO3/L)												
3	Ca (mg/L)												
4	Cl (mg/L)		O		O		O		O		O		O
5	CO3 (mg/L)		N		N		N		N		N		N
6	F (mg/L)		C		C		C		C		C		C
7	Fe (mg/L)	R	E	R	E	R	E	R	E	R	E	R	E
8	HCO3 (mg/L)	I		I		I		I		I		I	
9	K (mg/L)	V	I	V	I	V	I	V	I	V	I	V	I
10	Mg (mg/L)	E	N	E	N	E	N	E	N	E	N	E	N
11	Na (mg/L)	R		R		R		R		R		R	
12	NH3-N (mg N/L)		2		2		2		2		2		2
13	NO2+NO3 (mg N/L)	D		D		D		D		D		D	
14	NO2-N (mgN/L)	R	M	R	M	R	M	R	M	R	M	R	M
15	NO3-N (mgN/L)	Y	O	Y	O	Y	O	Y	O	Y	O	Y	O
16	P-Tot (mgP/L)		N		N		N		N		N		N
17	SiO2 (mg/L)		T		T		T		T		T		T
18	SO4 (mg/L)		H		H		H		H		H		H
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)												
2	COD (mg/L)												
3	DO (mg/L)												
4	DO_SAT% (%)												
5	FCol-MPN (MPN/100mL)												
6	Tcol-MPN (MPN/100mL)												
	TRACE & TOXIC												
1	Al (mg/L)												
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)												
2	HAR_Total (mgCaCO3/L)												
3	Na% (%)												
4	RSC (-)												
5	SAR (-)												
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	R I V E	R I V E	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	R	R	R	R
2	Alpha- BHC	Alpha- BHC	microgram / l	D	D	D	D	D	D	-	D	D	D	D	D	D	-	D	D	-	D	D	D	-	D	D	D	D	D	D
3	Beta-BHC	Beta-BHC	microgram / l	R	R	R	R	R	R	-	R	R	R	R	R	R	-	R	R	-	R	R	R	-	R	R	R	R	R	R
4	Gama- BHC	gamma-BHC (Benzene HexaChloride)	microgram / l	Y	Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	-	Y	Y	-	Y	Y	Y	-	Y	Y	Y	Y	Y	Y
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 : 2016-2017

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)	337	74.42	0.000	2.082
2	EC_FLD (µmho/cm)	RIVER DRY / ONCE IN 2 MONTH	RIVER DRY / ONCE IN 2 MONTH	RIVER DRY / ONCE IN 2 MONTH	RIVER DRY / ONCE IN 2 MONTH
3	EC_GEN (µmho/cm)				
4	pH_FLD (pH units)				
5	pH_GEN (pH units)				
6	SS (mg/L)				
7	TDS (mg/L)				
8	Temp (deg C)				
9	Turb (NTU)				
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)				
2	ALK-TOT (mgCaCO3/L)				
3	Ca (mg/L)				
4	Cl (mg/L)				
5	CO3 (mg/L)				
6	F (mg/L)				
7	Fe (mg/L)				
8	HCO3 (mg/L)				
9	K (mg/L)				
10	Mg (mg/L)				
11	Na (mg/L)				
12	NH3-N (mg N/L)				
13	NO2+NO3 (mg N/L)				
14	NO2-N (mgN/L)				
15	NO3-N (mgN/L)				
16	P-Tot (mgP/L)				
17	SiO2 (mg/L)				
18	SO4 (mg/L)				
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)				
2	COD (mg/L)				
3	DO (mg/L)				
4	DO_SAT% (%)				
5	FCol-MPN (MPN/100mL)				
6	Tcol-MPN (MPN/100mL)				
	TRACE & TOXIC				
1	Al (mg/L)				
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)				
2	HAR_Total (mgCaCO3/L)				
3	Na% (%)				
4	RSC (-)				
5	SAR (-)				
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Banas | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	3.957	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	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	O	5.0	20.0	26.0	M	M	M	M	O	20.0	M	M	O	O	22.0	14.0	O	M	M	M	M	M	M	M	O	O	O	O	O
5	CO3 (mg/L)	0.0	0.0	O	O	0.0	3.5	0.0	N	2.5	12.0	7.0	O	O	O	O	N	3.5	O	O	N	N	5.0	7.0	N	O	O	O	O	O	O	O	N	N	N	N	N
6	F (mg/L)	0.26	0.61	N	N	0.68	0.50	0.19	C	0.61	0.61	0.12	N	N	N	N	C	0.76	N	N	C	C	0.46	0.62	C	N	N	N	N	N	N	N	C	C	C	C	C
7	Fe (mg/L)	0.1	0.0	T	T	0.3	0.3	0.1	E	0.2	0.2	0.3	T	T	T	T	E	0.3	T	T	E	E	0.2	0.3	E	T	T	T	T	T	T	T	E	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	I	0.8	0.7	0.9	/	/	/	/	I	0.8	/	/	I	I	0.7	0.8	I	/	/	/	/	/	/	/	I	I	I	I	I
10	Mg (mg/L)	4.8	8.3			5.8	8.8	6.8	N	9.7	8.8	11.5					N	4.9			N	N	9.7	8.8	N								N	N	N	N	N
11	Na (mg/L)	10.0	18.0			19.3	15.4	8.4		3.4	13.3	19.0	P	P	P	P	2	13.5	P	P	2	2	15.4	9.1	2	P	P	P	P	P	P	P	2	2	2	2	2
12	NH3-N (mg N/L)			P	P	0.17	0.28	0.14	2	0.31	0.77	0.55	O	O	O	O		0.12	O	O				0.46		O	O	O	O	O	O	O					
13	NO2+NO3 (mg N/L)	0.12	0.21	O	O	0.80	1.01	1.10	M	0.69	2.59	1.88	O	O	O	O	M	1.20	O	O	M	M	1.96	1.52	M	O	O	O	O	O	O	O	M	M	M	M	M
14	NO2-N (mgN/L)	0.02	0.01	L	L	0.03	0.01	0.03	O	0.01	0.02	0.35	L	L	L	L	O	0.01	L	L	O	O	0.01	0.29	O	L	L	L	L	L	L	L	O	O	O	O	O
15	NO3-N (mgN/L)	0.10	0.20	I	I	0.77	0.99	1.07	N	0.68	2.57	1.53	I	I	I	I	N	1.19	I	I	N	N	1.95	1.23	N	I	I	I	I	I	I	I	N	N	N	N	N
16	P-Tot (mgP/L)	0.010	0.020	N	N	0.050	0.050	0.080	T	0.085	0.090	0.080	N	N	N	N	T	0.060	N	N	T	T	0.080	0.090	T	N	N	N	N	N	N	N	T	T	T	T	T
17	SiO2 (mg/L)	9.8	18.3	G	G	26.1	25.3	34.4	H	24.1	23.6	18.7	G	G	G	G	H	24.4	G	G	H	H	21.0	16.9	H	G	G	G	G	G	G	G	H	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	R	3.1	2.3	6.0	O	O	O	O	R	0.3	O	O	R	R	1.7	1.8	R	O	O	O	O	O	O	O	R	R	R	R	R
2	COD (mg/L)			N	N				D			44.4	N	N	N	N	D		N	N	D	D	4.0	11.0	D	N	N	N	N	N	N	N	D	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

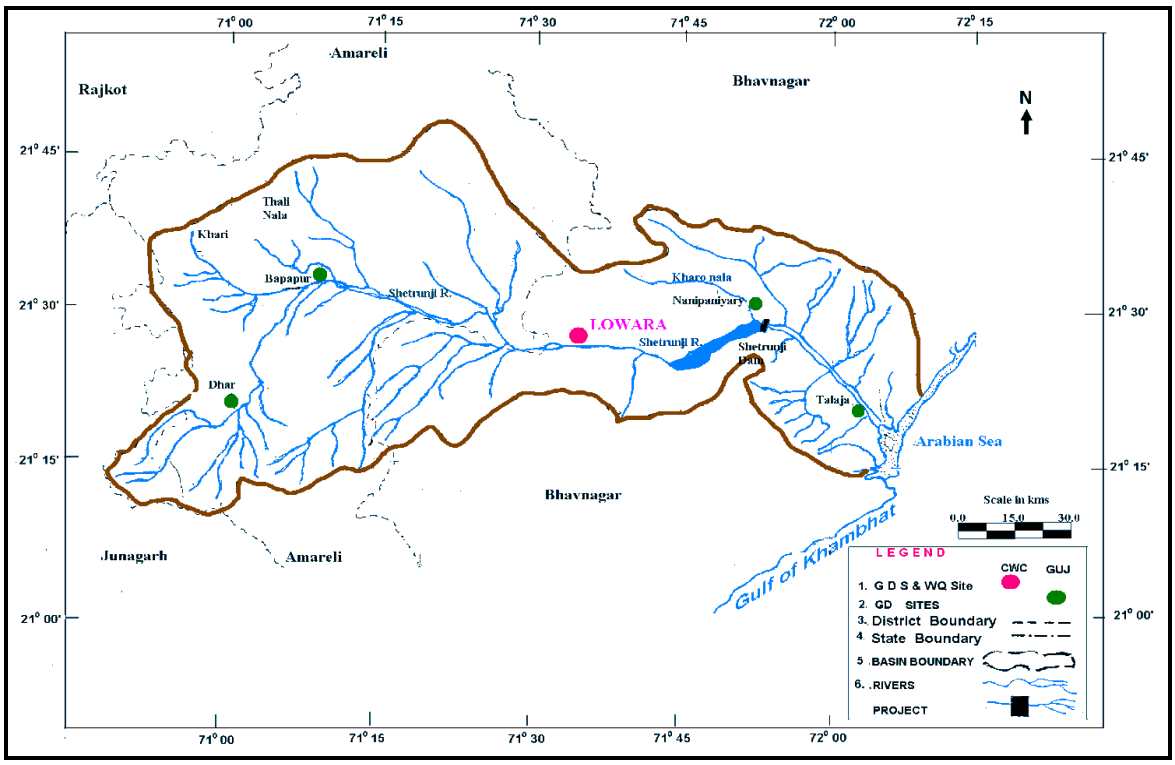
5.1 Basin description

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'.

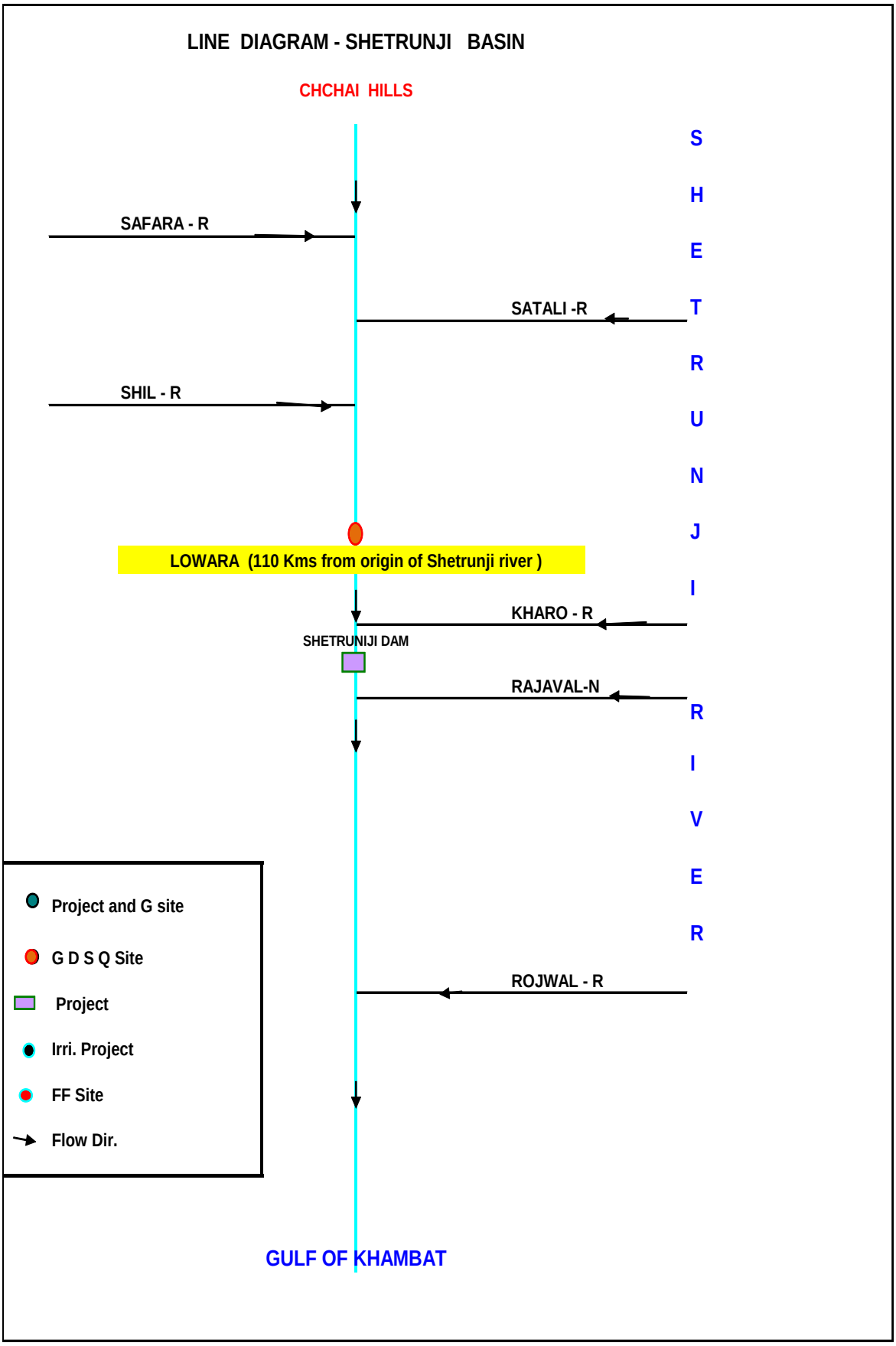
The Shetrunji receives several tributaries on both the banks. There are 9 tributaries having length more than 15 km. Out of which Safara, Shel, Kharai and Talaji are four tributaries on the right bank and remaining five tributaries viz. Stali, Thebu, Gagadia, Rajawal and Kharo are on the left bank. The 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	**: 2016-17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.110	0.693	1.107	0.840	0.372	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)			Clear		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			800		3650		3700		4780		5970	
4	EC_GEN (µmho/cm)			815		3667		4707		8036		10152	
5	Odour_Code (-)			odour free		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			8.5		8.4		8.5		8.7		8.6	
7	pH_GEN (pH units)			7.7		8.0		8.4		8.2		8.3	
8	SS (mg/L)			24		84		88		172		152	
9	TDS (mg/L)			523		2485		3196		5613		7013	
10	Temp (deg C)			26.0		24.0		17.0		14.0		21.0	
11	Turb (NTU)			59.0		4.0		6.0		3.0		5.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		0.0		10.0		0.0		4.2	
2	ALK-TOT (mgCaCO3/L)			120		328		404		628		836	
3	Ca (mg/L)			48		84		103		235		290	
4	Cl (mg/L)			130.0		960.0		1370.0		2470.0		3150.0	
5	CO3 (mg/L)			0.0		0.0		12.0		0.0		5.0	
6	F (mg/L)		O	0.82	O	0.57	O	0.88	O	0.92	O	0.95	O
7	Fe (mg/L)		N	0.6	N	0.8	N	0.8	N	0.9	N	1.0	N
8	HCO3 (mg/L)	R	C	146	C	400	C	468	C	766	C	1010	C
9	K (mg/L)	I	E	3.6	E	7.2	E	11.7	E	11.1	E	7.4	E
10	Mg (mg/L)	V E	I	17.7	I	37.9	I	54.5	I	48.6	I	51.6	I
11	Na (mg/L)	R	N	85.1	N	673.9	N	923.5	N	1757.0	N	2275.0	N
12	NH3-N (mg N/L)			0.36		0.97		1.33		1.01		1.01	
13	NO2+NO3 (mg N/L)		2	2.11	2	3.08	2	3.84	2	4.36	2	3.78	2
14	NO2-N (mgN/L)			0.57		0.04		0.17		0.06		0.04	
15	NO3-N (mgN/L)	D	M	1.54	M	3.04	M	3.67	M	4.30	M	3.74	M
16	P-Tot (mgP/L)	R	O	0.080	O	0.140	O	0.150	O	0.160	O	0.170	O
17	SiO2 (mg/L)	Y	N	12.1	N	20.1	N	23.1	N	29.6	N	61.3	N
18	SO4 (mg/L)		T	51.4	T	64.4	T	72.5	T	83.8	T	92.1	T
	BIOLOGICAL/BACTERIOLOGICAL		H		H		H		H		H		H
1	BOD3-27 (mg/L)			3.0		2.3		1.7		1.8		2.4	
2	COD (mg/L)			6.0		20.0		45.0		79.0		134.0	
3	DO (mg/L)			6.6		7.8		5.9		8.4		5.9	
4	DO_SAT% (%)			81		93		61		81		67	
5	FCol-MPN (MPN/100mL)			330		20		45		20		45	
6	Tcol-MPN (MPN/100mL)			1700		45		78		78		490	
	TRACE & TOXIC												
1	Al (mg/L)			0.04		0.09		0.10		0.11		0.12	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			120		210		257		586		724	
2	HAR_Total (mgCaCO3/L)			194		368		484		789		939	
3	Na% (%)			48		80		80		83		84	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			2.7		15.3		18.3		27.3		32.4	
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
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	0.52	3.57	6.00	0.920
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	0.10	0.23	0.00	24.40
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	0.24	20.35	3.00	106.0
4	Cu	Copper	microgram / l							6.87				17.87			4.800	-	1.640	28.28	9.70	-	41.28	1.69	-	38.57	0.23	22.39	10.00	19.30
5	Hg	Mercury	microgram / l							0.51				-			0.014	0.126	-	-	-	0.200	-	-	0.00	-	-	-	-	0.158
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	0.09	39.11	86.0	78.00
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	0.26	14.86	1.00	69.00
8	Zn	Zinc	microgram / l							13.18				BDL			14.00	23.50	10.00	26.00	10.10	9.00	11.10	3.90	6.87	4.80	0.09	4.40	28.0	20.36
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							-				-			-		-	-	-	-	-	-	-	-	-	-	-	-

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 : 2016-2017

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)	344	850.9	0.000	5.406
2	EC_FLD (µmho/cm)	5	5970	800	3780
3	EC_GEN (µmho/cm)	5	10152	815	5475
4	pH_FLD (pH units)	5	8.7	8.4	8.5
5	pH_GEN (pH units)	5	8.4	7.7	8.1
6	SS (mg/L)	5	172	24	104
7	TDS (mg/L)	5	7013	523	3766
8	Temp (deg C)	5	26.0	14.0	20.4
9	Turb (NTU)	5	59.0	3.0	15.4
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	10.0	0.0	2.8
2	ALK-TOT (mgCaCO3/L)	5	836	120	463
3	Ca (mg/L)	5	290	48	152
4	Cl (mg/L)	5	3150.0	130.0	1616
5	CO3 (mg/L)	5	12.0	0.0	3.4
6	F (mg/L)	5	0.95	0.57	0.83
7	Fe (mg/L)	5	1.0	0.6	0.8
8	HCO3 (mg/L)	5	1010	146	558
9	K (mg/L)	5	11.7	3.6	8.2
10	Mg (mg/L)	5	54.5	17.7	42.1
11	Na (mg/L)	5	2275.0	85.1	1142.9
12	NH3-N (mg N/L)	5	1.33	0.36	0.94
13	NO2+NO3 (mg N/L)	5	4.36	2.11	3.43
14	NO2-N (mgN/L)	5	0.57	0.04	0.18
15	NO3-N (mgN/L)	5	4.30	1.54	3.26
16	P-Tot (mgP/L)	5	0.170	0.080	0.14
17	SiO2 (mg/L)	5	61.3	12.1	29.2
18	SO4 (mg/L)	5	92.1	51.4	72.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	3.0	1.7	2.2
2	COD (mg/L)	5	134.0	6.0	56.8
3	DO (mg/L)	5	8.4	5.9	6.9
4	DO_SAT% (%)	5	93	61	77
5	FCol-MPN (MPN/100mL)	5	330	20	92
6	Tcol-MPN (MPN/100mL)	5	1700	45	478
	TRACE & TOXIC				
1	Al (mg/L)	5	0.12	0.04	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	724	120	379
2	HAR_Total (mgCaCO3/L)	5	939	194	555
3	Na% (%)	5	84	48	75
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	32.4	2.7	19.2
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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

Local River : Shetrunji | **River Water** | **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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	32.08	29.29	263.6	11.55	0.493	207.7	88.54	0.092	3.029	83.12	1.197	0.478	0.175	0.000	2.110	0.760	0.000	0.678	0.199	0.000	0.649	0.000	0.100	0.303	0.000	0.000	0.000	0.187	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)									1575	4243	2075	2225					O			O	6165	7765	6985	4240	O	O	O	O	O	O	O		7820	8230	12620	5970
3	EC_GEN (µmho/cm)	695	1669	564	766	5494	680	880	1406	1562	5834	2046	2241	4951	7280	5592	4995	N	2452	4784	N	7531	8793	6867	6372	N	N	N	N	N	N	N		9919	12104	13678	10152
4	pH_FLD (pH units)									8.6	8.5	8.5	8.4					C			C	8.1	8.4	8.6	8.6	C	C	C	C	C	C	C		8.4	8.9	8.7	8.6
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	7.8	8.0	7.9	8.0	8.1	E	8.1	8.0	E	8.4	8.2	8.3	8.3	E	E	E	E	E	E	E		8.3	8.3	8.3	8.3
6	SS (mg/L)	74	318	188	172	732	178	254	154	182	219	71	54	77	273	234	424		218	200		111	160	123	130									138	254	158	152
7	TDS (mg/L)	463	1171	390	516	3759	430	597	1006	1114	4237	1376	1504	3356	5016	4037	3612	I	1566	3820	I	5089	5966	4787	4405	I	I	I	I	I	I	I		6548	7940	9574	7013
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	25.0	16.5	21.5	15.5	21.0	N	20.0	18.0	N	13.5	15.0	15.0	15.5	N	N	N	N	N	N	N		20.0	22.0	22.0	21.0
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	31.5	6.0	6.5	7.0	10.0		11.0	10.0		11.5	7.0	2.5	4.5									4.0	6.0	8.0	5.0
	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	0.0	2	0.0	0.0	2	15.8	0.0	5.8	5.0	2	2	2	2	2	2	2		0.0	0.0	11.6	4.2
2	ALK-TOT (mgCaCO3/L)	242	382	257	304	606	132	186	255	238	588	184	224	560	876	957	1368		400	696		673	270	436	516								O	788	552	819	836
3	Ca (mg/L)	35	60	51	63	147	46	59	87	59	167	69	66	98	139	191	257	M	149	205	M	262	116	205	169	M	M	M	M	M	M	M	N	375	162	414	290
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	545.0	503.0	654.0	1204.0	952.0	O	640.0	1161.0	O	2161.5	2777.0	1840.0	1920.0	O	O	O	O	O	O	O	C	2759.0	6000.0	4750.0	3150.0
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	0.0	N	0.0	0.0	N	19.0	0.0	7.0	6.0	N	N	N	N	N	N	N	E	0.0	0.0	14.0	5.0
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	0.69	0.94	1.15	0.66	1.04	T	0.88	1.03	T	0.81	0.83	0.88	0.90	T	T	T	T	T	T	T		0.87	0.92	0.91	0.95
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	0.7	0.0	0.1	0.1	0.8	H	0.5	0.3	H	0.5	0.5	0.8	0.8	H	H	H	H	H	H	H	I	0.6	0.5	0.9	1.0
8	HCO3 (mg/L)	148	233	154	186	740	156	226	307	271	695	207	273	464	534	584	834	/	488	849	/	783	330	518	617	/	/	/	/	/	/	/	N	961	673	971	1010
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	5.4	6.0	12.5	1.2	5.2		3.3	18.0		9.0	2.3	9.0	11.4									7.2	9.0	19.8	7.4
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	27.8	45.4	45.7	46.7	71.0		33.0	48.6		79.2	123.2	72.5	51.6									52.2	193.2	90.6	51.6
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	379.5	387.0	503.0	840.3	672.0		432.3	871.5		1473.0	1743.0	1158.8	1340.3								2	1847.0	3994.0	3162.0	2275.0
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	0.67	0.56	0.11	0.20	0.36	P	0.40	0.36	P	0.85	2.61	0.27	1.17	P	P	P	P	P	P	P		1.28	0.66	0.45	1.01
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	2.59	0.48	5.30	5.27	9.36	O	4.98	4.54	O	5.66	3.77	2.29	4.10	O	O	O	O	O	O	O	M	5.66	1.48	0.85	3.78
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	0.30	0.06	0.49	0.11	0.32	O	0.10	0.02	O	0.13	0.09	0.06	0.12	O	O	O	O	O	O	O	O	0.12	0.22	0.01	0.04
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	2.29	0.42	4.81	5.16	9.04	L	4.88	4.52	L	5.52	3.69	2.24	3.99	L	L	L	L	L	L	L	N	5.54	1.26	0.84	3.74
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	0.110	0.045	0.070	0.025	0.050	I	0.130	0.150	I	0.125	0.130	0.145	0.155	I	I	I	I	I	I	I	T	0.150	0.120	0.170	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	16.1	19.0	35.2	31.1	35.1	N	33.7	42.6	N	22.0	19.1	18.3	26.3	N	N	N	N	N	N	N	H	25.0	19.2	22.0	61.3
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	57.9	178.0	253.0	124.8	158.2	G	79.4	133.0	G	77.0	97.5	78.1	78.1	G	G	G	G	G	G	G	/	83.1	95.6	88.7	92.1
	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	2.7	0.5	0.8	1.8	0.9	C	1.2	2.0	C	3.4	6.6	2.6	1.7	C	C	C	C	C	C	C		1.9	3.9	4.3	2.3
2	COD (mg/L)										148.9	50.8	13.0					O			O	160.2	62.5	75.0	62.0	O	O	O	O	O	O	O		110.8	80.3	234.0	134.0
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	7.2	7.5	6.9	10.0	9.2	N	6.8	7.2	N	10.4	9.8	7.7	7.2	N	N	N	N	N	N	N	R	8.0	4.0	6.8	5.9
4	DO_SAT% (%)	88	117	91	117	102	94	82	73	102	87	86	87	77	78	100	103	D	75	76	D	100	97	77	71	D	D	D	D	D	D	D	D	88	46	77	67
5	FCol-MPN (MPN/100mL)										1734	145	175					D			D	66	9400	2	33	D	D	D	D	D	D	D		840	200	20	45
6	Tcol-MPN (MPN/100mL)										11965	690	873					I			I	27104	46000	265	78	I	I	I	I	I	I	I		34500	10900	70	490
	TRACE & TOXIC																	T			T					T	T	T	T	T	T	T					
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	0.07	0.01	0.04	0.04	0.03	I	0.04	0.07	I	0.06	0.05	0.09	0.11	I	I	I	I	I	I	I		0.08	0.05	0.11	0.12
	CHEMICAL INDICES																	O			O					O	O	O	O	O	O	O					
1	HAR_Ca (mgCaCO3/L)	87	150	126	156	367	114	148	216	148	417	172	165	245	348	477	641	N	373	513	N	655	290	512	421	N	N	N	N	N	N	N		938	406	1035	724
2	HAR_Total (mgCaCO3/L)	123	217	163	197	695	153	198	265	248	625	319	281	434	538	671	937	/	510	716	/	986	803	814	636	/	/	/	/	/	/	/		1156	1211	1413	939
3	Na% (%)	44	53	36	40	75	46	48	69	70	59	60	64	66	66	71	61		65	72		77	83	75	81									78	88	83	84
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	0.0	R	0.0	0.0	R	0.0	0.0	0.0	0.0	R	R	R	R	R	R	R		0.0	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	9.0	8.1	9.4	13.5	9.6		8.3	14.2		20.5	26.9	17.5	22.8									23.7	50.2	36.7	32.4
	PESTICIDES																																				

6. BHADAR BASIN

6.0 Bhadar Basin

6.1 Basin description

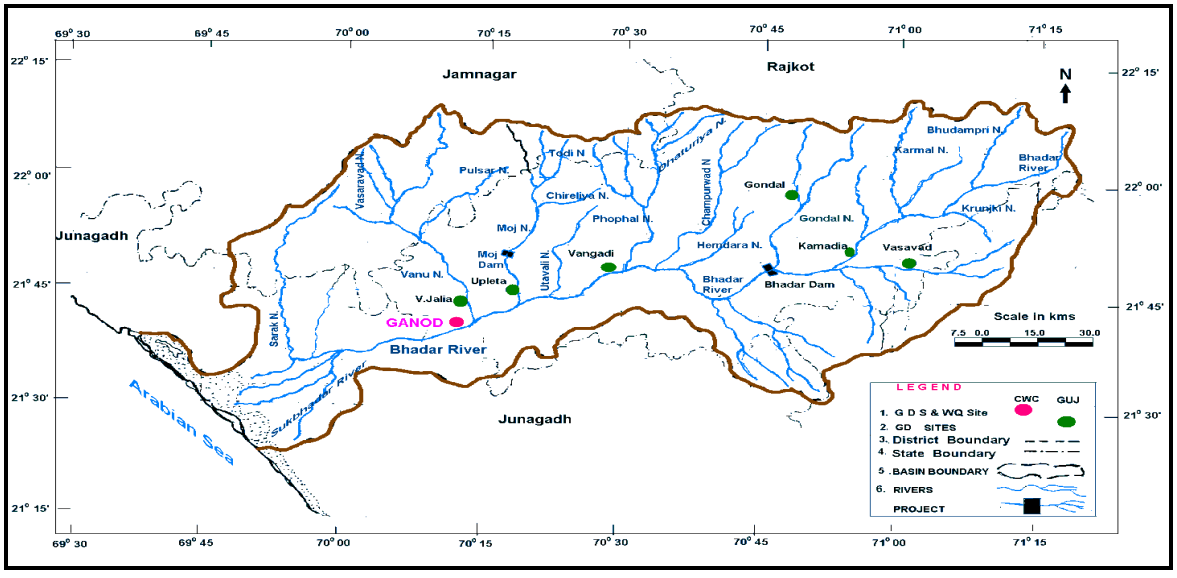
The Bhadar is one of the major rivers of Kathaiwar (Saurashtra) peninsula in Gujarat. Its basin map is enclosed. It originates near Vaddi (Aniali Village) about 26 km north – west of Jasdan in Rajkot district at an elevation of 261 m above mean sea level.

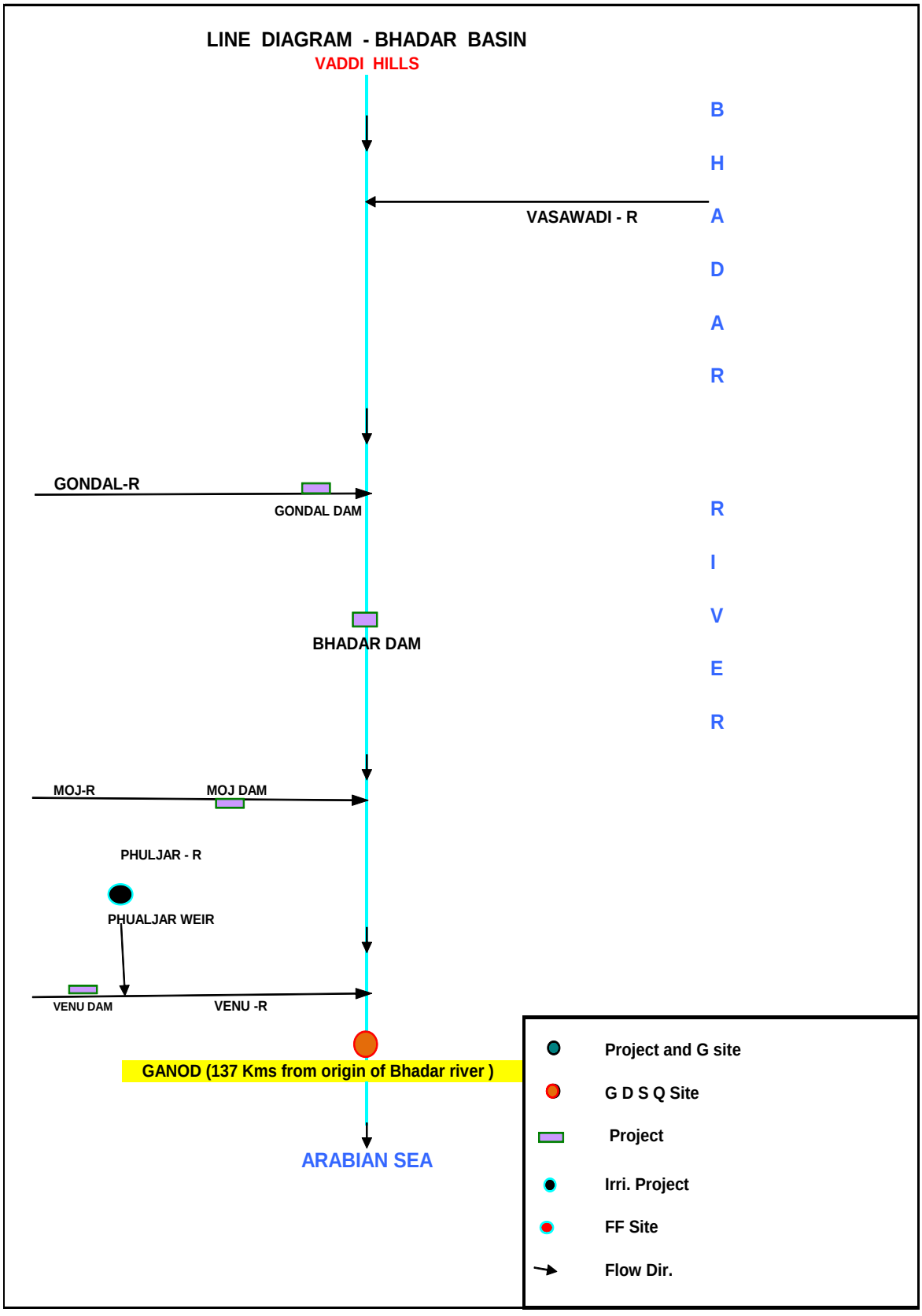
It flows towards South up to Jasdan and turns towards south - west upto Jetpur and finally changes its direction towards west till its confluence with Arabian sea at Naviobandar (Porbandar). The total length of this river is 198 km. It has a drainage area of 7094 sq.km out of which 706 sq km is in hilly 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	**: 2016 -17**
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 : 2016-2017

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	01-06-2016	01-07-2016	01-08-2016	01-09-2016	01-10-2016	01-11-2016	01-12-2016	02-01-2017	01-02-2017	01-03-2017	01-04-2017	01-05-2017
	PHYSICAL												
1	Q (cumec)	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	Colour_Cod (-)					Light Green		Clear		Clear		Brown	
3	EC_FLD (µmho/cm)					490		470		460		475	
4	EC_GEN (µmho/cm)					241		410		637		1222	
5	Odour_Code (-)					odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)					7.5		7.2		7.3		7.5	
7	pH_GEN (pH units)					9.2		8.5		8.4		8.5	
8	SS (mg/L)					90		76		17		16	
9	TDS (mg/L)					149		252		417		808	
10	Temp (deg C)					28.0		17.0		16.0		27.0	
11	Turb (NTU)					16.0		10.0		26.0		15.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)					19.9		11.6		15.8		14.1	
2	ALK-TOT (mgCaCO3/L)					96		147		204		328	
3	Ca (mg/L)					30		46		63		112	
4	Cl (mg/L)					26.0		46.0		80.0		170.0	
5	CO3 (mg/L)					24.0		14.0		19.0		17.0	
6	F (mg/L)		O		O	0.58	O	0.46	O	0.62	O	0.65	O
7	Fe (mg/L)		N		N	0.1	N	0.2	N	0.2	N	0.2	N
8	HCO3 (mg/L)	R	C	R	C	68	C	151	C	210	C	366	C
9	K (mg/L)	I	E	I	E	0.9	E	3.5	E	3.2	E	3.1	E
10	Mg (mg/L)	V E	I	V E	I	7.8	I	10.7	I	15.8	I	22.5	I
11	Na (mg/L)	R	N	R	N	18.5	N	35.2	N	58.4	N	118.1	N
12	NH3-N (mg N/L)					0.65		1.09		1.69		1.08	
13	NO2+NO3 (mg N/L)		2		2	0.85	2	0.19	2	0.29	2	0.89	2
14	NO2-N (mgN/L)					0.01		0.04		0.04		0.63	
15	NO3-N (mgN/L)	D	M	D	M	0.84	M	0.15	M	0.25	M	0.26	M
16	P-Tot (mgP/L)	R Y	O N	R Y	O N	0.040	O N	0.040	O N	0.050	O N	0.060	O N
17	SiO2 (mg/L)		T		T	9.2	T	13.3	T	15.5	T	56.4	T
18	SO4 (mg/L)		H		H	10.1	H	11.1	H	13.3	H	16.6	H
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)					4.4		4.0		3.9		2.2	
2	COD (mg/L)					17.0		16.0		23.0		74.0	
3	DO (mg/L)					7.0		8.9		9.3		10.0	
4	DO_SAT% (%)					89		92		94		126	
5	FCol-MPN (MPN/100mL)					20		20		17		170	
6	Tcol-MPN (MPN/100mL)					40		45		110		790	
	TRACE & TOXIC												
1	Al (mg/L)					0.03		0.03		0.04		0.05	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)					75		116		158		281	
2	HAR_Total (mgCaCO3/L)					108		161		224		374	
3	Na% (%)					27		32		36		41	
4	RSC (-)					0.0		0.0		0.0		0.0	
5	SAR (-)					0.8		1.2		1.7		2.7	
	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	01.08.2016	01.12.2016	01.04.2017	01.04.2017
				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	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
1	As	Arsenic	microgram / l							0.54							0.54	1.020	1.4	-	-	2.795	0.61	2.14				2.21	5.00	1.606
2	Cd	Cadmium	microgram / l							0.233							0.22	0.00	0.16	0.18	0.08	4.00	0.71	0.02				0.07	0.00	1.70
3	Cr	Chromium	microgram / l							6.32							6.39	0.00	2.82	13.36	1.42	0.00	3.73	5.90				3.79	4.00	0.00
4	Cu	Copper	microgram / l							11.48							7.56	-	0.03	9.34	3.06	-	1.29	1.98				15.80	6.00	9.20
5	Hg	Mercury	microgram / l							0.56							0.08	0.112	-	-	-	0.216	-	-				-	-	0.005
6	Ni	Nickel	microgram / l							-							9.14	0.00	2.68	0.20	1.56	11.24	2.70	3.79				7.79	39.0	8.00
7	Pb	Lead	microgram / l							3.22							1.68	77.00	0.046	1.17	106.8.	23.00	3.69	0.85				4.22	0.00	10.00
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	29.30	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	12.00	28.90	2.00	15.00	9.30	3.00	5.20	4.60	R I V E R	R I V E R	R I V E R	0.40	23.0	17.10
b	**Pesticides**		microgram / l																											
1	Aldrin	Aldrin	microgram / l	R	R	R	R	R	R	-	R	R	R	R	R	R	-	Pesticides value not reported .	-	-	-	-	-	-	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	-	-	-
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 : 2016-2017

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)	6	2164	0.000	10.74
2	EC_FLD (µmho/cm)	4	490	460	474
3	EC_GEN (µmho/cm)	4	1222	241	628
4	pH_FLD (pH units)	4	7.5	7.2	7.4
5	pH_GEN (pH units)	4	9.2	8.4	8.6
6	SS (mg/L)	4	90	16	50
7	TDS (mg/L)	4	808	149	407
8	Temp (deg C)	4	28.0	16.0	22
9	Turb (NTU)	4	26.0	10.0	16.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	4	19.9	11.6	15.4
2	ALK-TOT (mgCaCO3/L)	4	328	96	194
3	Ca (mg/L)	4	112	30	63
4	Cl (mg/L)	4	170.0	26.0	80.5
5	CO3 (mg/L)	4	24.0	14.0	18.5
6	F (mg/L)	4	0.65	0.46	0.58
7	Fe (mg/L)	4	0.2	0.1	0.2
8	HCO3 (mg/L)	4	366	68	199
9	K (mg/L)	4	3.5	0.9	2.7
10	Mg (mg/L)	4	22.5	7.8	14.2
11	Na (mg/L)	4	118.1	18.5	57.5
12	NH3-N (mg N/L)	4	1.69	0.65	1.13
13	NO2+NO3 (mg N/L)	4	0.89	0.19	0.55
14	NO2-N (mgN/L)	4	0.63	0.01	0.18
15	NO3-N (mgN/L)	4	0.84	0.15	0.37
16	P-Tot (mgP/L)	4	0.060	0.040	0.047
17	SiO2 (mg/L)	4	56.4	9.2	23.6
18	SO4 (mg/L)	4	16.6	10.1	12.8
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	4	4.4	2.2	3.6
2	COD (mg/L)	4	74.0	16.0	32.5
3	DO (mg/L)	4	10.0	7.0	8.8
4	DO_SAT% (%)	4	126	89	100
5	FCol-MPN (MPN/100mL)	4	170	17	57
6	Tcol-MPN (MPN/100mL)	4	790	40	246
	TRACE & TOXIC				
1	Al (mg/L)	4	0.05	0.03	0.04
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	4	281	75	157
2	HAR_Total (mgCaCO3/L)	4	374	108	217
3	Na% (%)	4	41	27	34
4	RSC (-)	4	0.0	0.0	0
5	SAR (-)	4	2.7	0.8	1.6
	PESTICIDES				

Water Quality Seasonal Average for the period: 2005-2017

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	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	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	0.000	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	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)	474	532	218						650	500	1118	490	O	O							525	500	559	465	O	O							500	500		475
3	EC_GEN (µmho/cm)	460	552	649	629	670	597	746		304	1235	1012	241	N	N	1624	1881					1511	1107	889	524	N	N							1383	1602		1222
4	pH_FLD (pH units)	8.8	8.3	8.3						8.5	8.2	8.0	7.5	C	C							8.2	8.2	7.1	7.3	C	C							8.3	8.1		7.5
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	9.2	E	E	8.1	8.1					8.6	8.5	8.6	8.4	E	E							8.5	8.6		8.5
6	SS (mg/L)	50	96	34	32	63	35	94		77	64	77	90			66	70					127	66	55	47									108	96		16
7	TDS (mg/L)	301	419	421	417	438	371	493		181	813	653	149			1036	1282					991	705	586	335									892	976		808
8	Temp (deg C)	27.8	28.0	28.3	27.8	28.0	27.5	26.0		28.5	30.3	29.3	28.0	I	I	21.0	23.0					17.0	25.0	17.0	16.5	I	I							28.0	29.0		27.0
9	Turb (NTU)	1.5	174.0	9.5	129.0	20.5	196.0	31.0		21.5	20.0	78.0	16.0	N	N	15.0	10.0					13.5	21.0	53.0	18.0	N	N							27.0	9.0		15.0
	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	19.9	2	2	0.0	0.0					12.0	10.0	6.2	13.7	2	2							8.3	14.1		14.1
2	ALK-TOT (mgCaCO3/L)	204	216	284	232	138	128	182		100	228	149	96			289	520					308	210	190	175									325	252		328
3	Ca (mg/L)	33	31	55	46	62	46	75		33	74	50	30	M	M	74	101	P	P	P		106	67	68	55	M	M	P	P	P	P	P	O	96	74	P	112
4	Cl (mg/L)	39.0	57.0	74.0	64.0	119.0	98.0	128.0		34.0	224.7	188.0	26.0	O	O	206.0	320.0	O	O	O		321.0	253.5	145.0	63.0	O	O	O	O	O	O	O	N	350.0	350.0	O	170.0
5	CO3 (mg/L)	2.5	0.0	2.5	2.5	3.5	0.0	0.0		6.0	10.3	9.7	24.0	N	N	0.0	0.0	O	O	O		14.5	12.0	7.5	16.5	N	N	O	O	O	O	O	C	10.0	17.0	O	17.0
6	F (mg/L)	0.31	0.72	0.60	0.69	0.90	0.60	0.50		0.66	0.76	0.52	0.58	T	T	0.70	0.33	L	L	L		0.82	0.90	0.50	0.54	T	T	L	L	L	L	L	E	0.92	0.91	L	0.65
7	Fe (mg/L)	0.0	0.1	0.2	1.1	1.0	0.1	0.1		0.1	0.2	0.2	0.1	H	H	0.1	0.9	I	I	I		0.3	0.3	0.2	0.2	H	H	I	I	I	I	I		0.4	0.3	I	0.2
8	HCO3 (mg/L)	122	132	171	139	161	157	222		110	257	163	68	/	/	176	317	N	N	N	R	347	232	217	181	/	/	N	N	N	N	N	I	376	273	N	366
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	0.9			0.3	4.6	G	G	G	I	2.7	1.1	1.4	3.4			G	G	G	G	G	N	1.8	3.6	G	3.1
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	7.8			10.7	26.2				V	29.6	25.7	17.6	13.2									25.3	30.9		22.5
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	18.5			147.0	216.7				E	224.4	170.6	91.4	46.8									243.4	243.4		118.1
12	NH3-N (mg N/L)			0.05	0.56	0.38	0.25	0.49	E	0.56	0.83	0.34	0.65	P	P		0.47	C	C	C	R	0.72	0.31	0.27	1.39	P	P	C	C	C	C	C	2	1.15	0.28	C	1.08
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	0.85	O	O	3.40	8.61	O	O	O		5.30	0.80	0.98	0.24	O	O	O	O	O	O	O		5.30	0.26	O	0.89
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	0.01	O	O	0.06	0.62	N	N	N		0.04	0.01	0.05	0.04	O	O	N	N	N	N	N	M	0.07	0.02	N	0.63
15	NO3-N (mgN/L)	0.17	0.72	2.68	2.34	3.05	3.60	4.76		2.13	1.11	0.55	0.84	L	L	3.35	7.99	D	D	D	D	5.25	0.79	0.93	0.20	L	L	D	D	D	D	D	O	5.23	0.24	D	0.26
16	P-Tot (mgP/L)	0.010	0.045	0.020	0.065	0.065	0.050	0.090	D	0.070	0.080	0.080	0.040	I	I	0.030	0.080	I	I	I	R	0.085	0.095	0.075	0.045	I	I	I	I	I	I	I	N	0.100	0.110	I	0.060
17	SiO2 (mg/L)	11.0	28.3	29.0	33.3	23.2	26.5	38.4	R	13.9	30.5	20.9	9.2	N	N	44.0	22.5	T	T	T	Y	38.0	28.3	27.0	14.4	N	N	T	T	T	T	T	T	44.7	29.7	T	56.4
18	SO4 (mg/L)	11.6	8.9	29.2	30.6	41.5	13.5	15.6	Y	11.9	20.1	38.8	10.1	G	G	61.4	80.0	I	I	I		26.5	31.9	23.4	12.2	G	G	I	I	I	I	I	H	29.7	34.1	I	16.6
	BIOLOGICAL/BACTERIOLOGICAL																	O	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	4.4			1.9	3.3	N	N	N		1.1	2.5	4.8	3.9			N	N	N	N	N		0.9	1.8	N	2.2
2	Chlf-a (µg/L)											120.0		C	C											C	C										
3	COD (mg/L)										33.1	64.3	17.0	O	O			/	/	/		212.8	62.3	25.0	19.5	O	O	/	/	/	/	/	R	49.2	9.0	/	74.0
4	DO (mg/L)	5.3	6.8	7.2	7.3	7.2	8.3	9.0		9.4	6.2	6.8	7.0	N	N	7.8	8.1					8.5	7.5	9.3	9.1	N	N						D	6.7	5.4		10.0
5	DO_SAT% (%)	68	87	92	93	92	104	112		121	82	89	89	D	D	87	94	R	R	R		88	90	96	93	D	D	R	R	R	R	R		86	70	R	126
6	FCol-MPN (MPN/100mL)										1433	363	20	I	I			D	D	D		61	2700	405	19	I	I	D	D	D	D	D		27	17	D	170
7	Tcol-MPN (MPN/100mL)										15200	26482	40	T	T							21306	27100	760	78	T	T							13000	278		790
	TRACE & TOXIC													I	I											I	I										
1	Al (mg/L)	0.02	0.06	0.07	0.05	0.02	0.03	0.03		0.03	0.08	0.05	0.03	O	O	0.02	0.03					0.06	0.05	0.05	0.03	O	O							0.07	0.06		0.05
	CHEMICAL INDICES													N	N											N	N										
1	HAR_Ca (mgCaCO3/L)	82	78	136	116	154	114	186		82	184	126	75	/	/	184	253					265	166	170	137	/	/							241	185		281
2	HAR_Total (mgCaCO3/L)	112	107	181	157	215	145	219		129	256	225	108			229	362					388	273	244	192									346	314		374
3	Na% (%)	35	42	38	37	40	44	43		27	49	45	27			58	56					55	58	44	34									60	63		41
4	RSC (-)	0.0	0.1	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	R	R	0.0	0.0					0.0	0.0	0.0	0.0	R	R							0.0	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	0.8	D	D	4.2	5.0					4.9	4.5	2.5	1.5	D	D							5.7	6.0		2.7
	PESTICIDES																																				

7. TAPI BASIN

7.0 Tapi Basin

7.1 Basin description

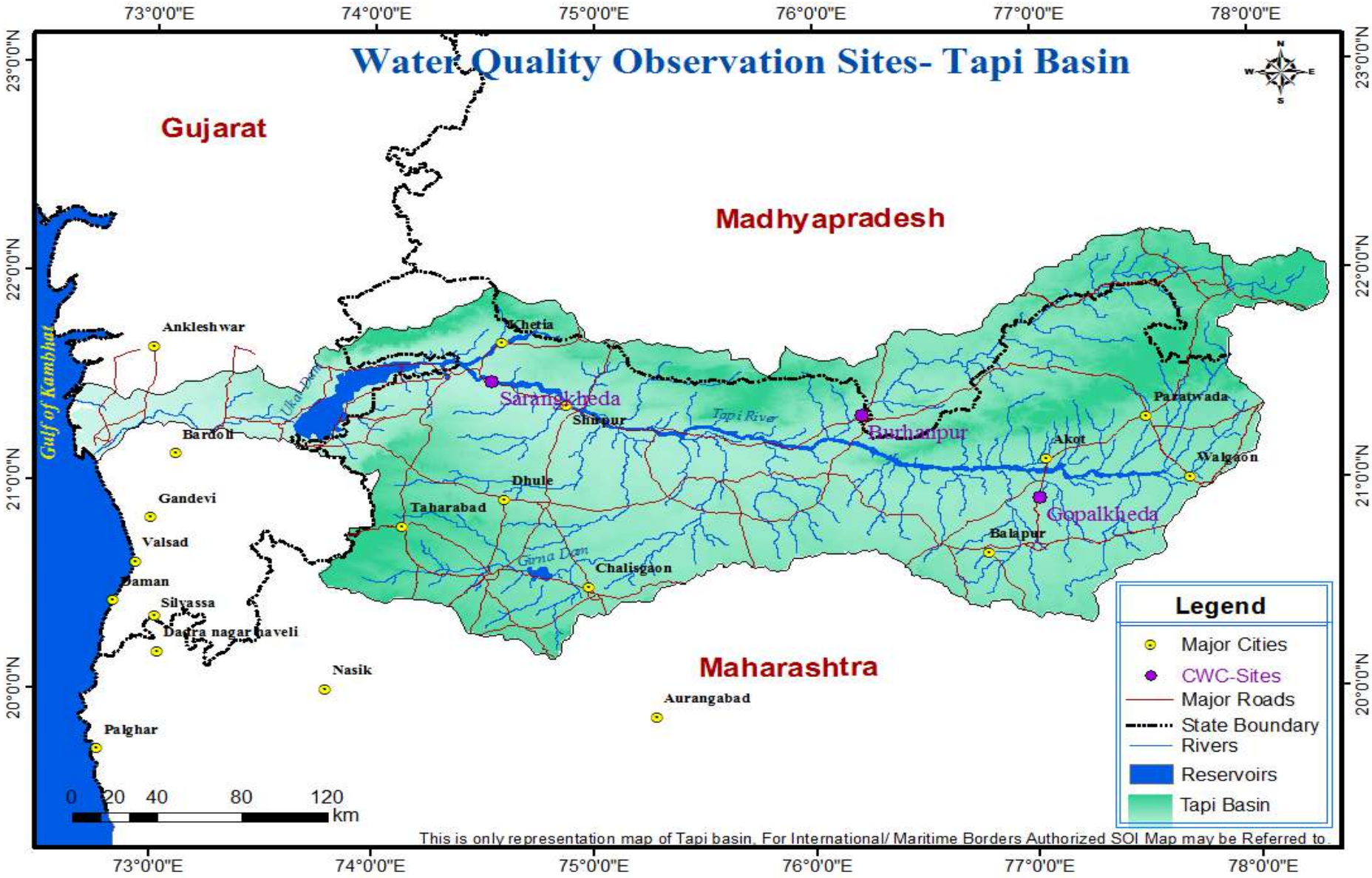
The Tapi is the second largest westward draining interstate river basin. Its basin map is enclosed. It originates near Multai in Betul district at an elevation of 752 m above *msl*. The total length of this west flowing river from its origin to its out- fall into gulf of Cambay is 724 km. It drains an 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

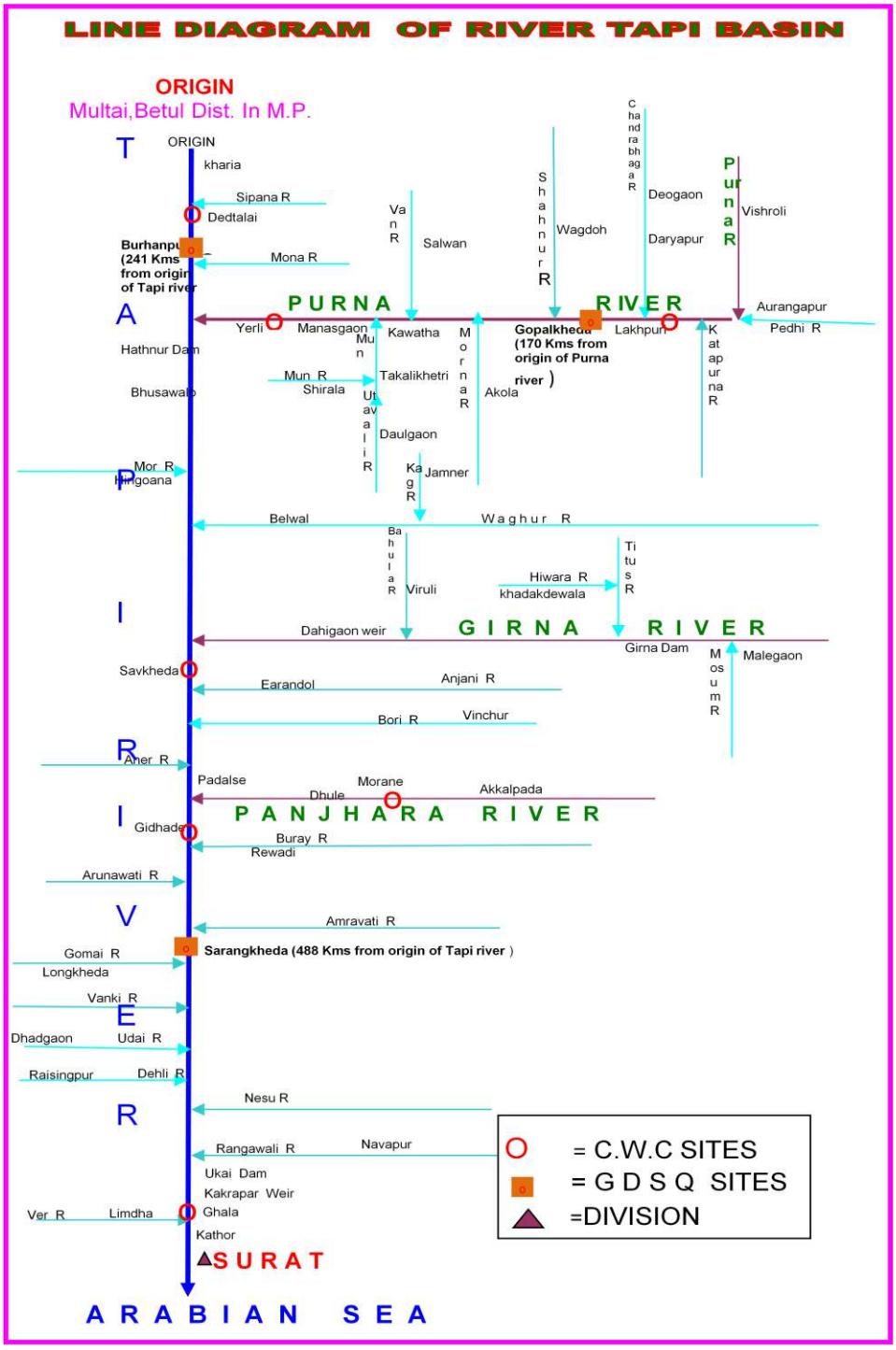
The Purna and Girna, two important left bank tributaries, together account for nearly 45% of the total catchment area of the Tapi. The Purna is the principal tributary of the Tapi and originates in Betul district near Gawilgarh hills of Satpura range at an elevation of 900 m. It traverses 274 km having 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
Saranikheda
Shirpur
Dhule
Taharabad
Chalisgaon
Burhanpur
Akot
Balapur
Gopalkheda
Paratwada
Walgaon
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



7.2 Water Quality Data

HISTORY SHEET

			Water Year	**:**	**2016-2017**
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 : 2016-2017

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

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

S.No	Parameters	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	537.0	368.4	353.8	54.02	5.773	4.095	3.169	0.969	0.000	0.000
2	Colour_Cod (-)	Clear	Clear	2	Brown	Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)												
4	EC_GEN (µmho/cm)	400	280	360	380	419	430	487	516	478	538	400	1180
5	Odour_Code (-)	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour	odour free	odour free	odour free	odour free
6	pH_FLD (pH units)	7.0	7.0	7.0	7.0	7.8	7.0	7.0	7.0	7.0	7.0	7.0	8.0
7	pH_GEN (pH units)	8.2	7.6	7.2	7.9	8.0	8.2	8.1	8.3	7.8	8.2	8.0	8.2
8	SS (mg/L)	100	100	100	95	140	140	170	180	150	170	150	350
9	TDS (mg/L)	260	180	230	245	266	276	313	344	310	345	260	763
10	Temp (deg C)	30.0	30.0	27.0	26.0	25.0	26.0	22.0	18.0	22.0	24.0	29.0	27.0
11	TS (mg/L)	1355	802	330	275	406	416	483	524	460	515	400	1113
12	Turb (NTU)	2.0	6.0	6.0	32.0	2.0	1.0	1.0	1.0	2.0	1.0	3.0	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)	90	115	90	85	75	90	180	160	190	120	90	120
3	Ca (mg/L)	30	34	32	28	31	30	36	32	36	40	38	44
4	Cl (mg/L)	60.0	54.0	60.0	80.0	70.0	70.0	70.0	70.0	55.0	80.0	70.0	215.3
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)	0.10	0.11	0.12	0.08	0.13	0.13	0.14	0.14	0.14	0.13	0.11	0.10
7	HCO3 (mg/L)	110	140	110	104	92	110	220	195	232	146	110	146
8	K (mg/L)	3.8	4.0	4.0	4.0	4.0	4.0	3.0	3.2	4.0	4.0	4.0	35.5
9	Mg (mg/L)	6.1	7.2	7.3	10.0	8.0	10.9	26.7	21.4	26.7	15.3	3.7	8.5
10	Na (mg/L)	42.0	42.0	40.0	48.0	40.0	42.0	42.0	48.0	42.0	48.0	46.0	130.0
11	NH3-N (mg N/L)	0.09	0.06	0.10	0.32	0.35	0.12	0.13	0.12	0.12	0.12	0.16	0.08
12	NO2+NO3 (mg N/L)	0.15	0.16	0.17	0.15	0.20	0.19	0.20	0.18	0.20	0.16	0.20	0.16
13	NO2-N (mgN/L)	0.05	0.05	0.05	0.05	0.07	0.06	0.06	0.05	0.08	0.04	0.06	0.06
14	NO3-N (mgN/L)	0.10	0.11	0.12	0.10	0.13	0.13	0.14	0.13	0.12	0.12	0.14	0.10
15	P-Tot (mgP/L)	0.120	0.110	0.130	0.120	0.140	0.110	0.120	0.140	0.130	0.100	0.140	0.110
16	SiO2 (mg/L)	10.0	12.0	12.0	10.0	10.0	10.0	14.0	14.0	10.0	8.0	12.0	10.0
17	SO4 (mg/L)	12.0	10.0	11.0	9.0	10.0	11.0	10.0	11.0	12.0	14.0	8.0	16.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	0.8	2.0	1.2	1.4	1.0	2.2	2.7	1.0	1.8	4.3	1.2	3.9
2	COD (mg/L)	120.0	72.0	48.0	16.0	24.0	80.0	8.0	16.0	40.0	60.0	32.0	104.0
3	DO (mg/L)		1.3	10.2	9.0		7.4	8.2	6.9	7.5	7.5	4.3	5.0
4	DO_SAT% (%)		17	128	111		91	94	73	85	89	56	63
5	FCol-MPN (MPN/100mL)	3000	900	400	600	1200	800	1100	800	500	700	1100	1300
6	Tcol-MPN (MPN/100mL)	6000	2000	1000	1600	3000	1400	2400	1800	800	1200	200	2800
	TRACE & TOXIC												
1	Al (mg/L)	0.07	0.09	0.09	0.05	0.09	0.11	0.05	0.06	0.11	0.08	0.10	0.07
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	75	85	80	69	77	75	90	80	90	99	95	110
2	HAR_Total (mgCaCO3/L)	100	115	111	111	111	121	202	169	202	163	110	145
3	Na% (%)	47	43	43	48	43	42	31	38	31	38	46	60
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	1.7	1.7	2.0	1.7	1.7	1.3	1.6	1.3	1.6	1.9	4.7
	PESTICIDES												

Water Quality Summary for the period :2016-2017

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	2245	0.000	139.5
2	EC_FLD (µmho/cm)				
3	EC_GEN (µmho/cm)	12	1180	280	489
4	pH_FLD (pH units)	12	8.0	7.0	7.2
5	pH_GEN (pH units)	12	8.3	7.2	8
6	SS (mg/L)	12	350	95	154
7	TDS (mg/L)	12	763	180	316
8	Temp (deg C)	12	30.0	18.0	25.5
9	TS (mg/L)	12	1355	275	590
10	Turb (NTU)	12	32.0	1.0	4.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	12	190	75	117
3	Ca (mg/L)	12	44	28	34
4	Cl (mg/L)	12	215.3	54.0	79.5
5	CO3 (mg/L)	12	0.0	0.0	0
6	F (mg/L)	12	0.14	0.08	0.12
7	HCO3 (mg/L)	12	232	92	143
8	K (mg/L)	12	35.5	3.0	6.5
9	Mg (mg/L)	12	26.7	3.7	12.7
10	Na (mg/L)	12	130.0	40.0	50.8
11	NH3-N (mg N/L)	12	0.35	0.06	0.15
12	NO2+NO3 (mg N/L)	12	0.20	0.15	0.18
13	NO2-N (mgN/L)	12	0.08	0.04	0.06
14	NO3-N (mgN/L)	12	0.14	0.10	0.12
15	P-Tot (mgP/L)	12	0.140	0.100	0.122
16	SiO2 (mg/L)	12	14.0	8.0	11
17	SO4 (mg/L)	12	16.0	8.0	11.2
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	4.3	0.8	1.9
2	COD (mg/L)	12	120.0	8.0	51.7
3	DO (mg/L)	10	10.2	1.3	6.7
4	DO_SAT% (%)	10	128	17	81
5	FCol-MPN (MPN/100mL)	12	3000	400	1033
6	Tcol-MPN (MPN/100mL)	12	6000	200	2017
	TRACE & TOXIC				
1	Al (mg/L)	12	0.11	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	110	69	86
2	HAR_Total (mgCaCO3/L)	12	202	100	138
3	Na% (%)	12	60	31	42
4	RSC (-)	12	0.0	0.0	0
5	SAR (-)	12	4.7	1.3	1.9
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2017

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

Local River: Tapi Sub Division: UTSD, Bhusawal

S.No	Parameters	Flood												Winter												Summer										
		Jun - Oct												Nov - Feb												Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																			
1	Q (cumec)	1139	611.0	371.4	79.94	93.12	340.6	358.6	528.7	1806	430.3	108.4	251.8	6.669	7.334	6.985	4.434	10.48	13.32	5.642	10.12	29.29	8.833	0.000	16.76	0.705	0.403	3.938	1.513	4.834	0.000	0.000	0.779	1.630	0.000	0.000	0.323
2	EC_FLD (µmho/cm)		866	221	225	290	420	291	214		280				895	373	424	391	305	370	294	500		927			463	526	247	132							
3	EC_GEN (µmho/cm)	588	392	363	424	414	667	322	272	532	672	407	368	379	776	568	499	378	403	498	473	518	456	456	478	951	623	617	593	520			533	617	457	397	706
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	7.2		7.5	7.0	7.6	7.3	7.8		8.0	7.7	8.0	7.0	7.0	7.0	8.1	7.9	8.0	8.7			8.0			7.7	7.3
5	pH_GEN (pH units)	8.6	7.9	8.0	7.4	7.6	8.3	7.5	7.6	8.2	8.3	8.1	7.8	8.5	8.1	8.1	7.5	7.5	8.3	7.0	7.8	7.9	8.2	8.0	8.1	8.1	8.7	7.8	8.0	8.2			8.1	8.3	8.0	8.2	8.1
6	SS (mg/L)	74	93	134	141	150	213	108	94	200	178	154	107	74	175	175	152	121	168	177	152	155	180	130	160	116	204	195	202	166			167	187	140	130	223
7	TDS (mg/L)	423	303	246	276	274	461	205	184	346	434	260	236	266	575	371	319	234	303	338	307	332	293	285	311	763	502	407	410	350			345	391	285	257	456
8	Temp (deg C)	28.5	26.9	27.9	19.2	27.8	27.4	29.5	25.3	25.8	25.8	26.4	27.6	22.5	24.9	24.0	18.8	21.0	24.8	22.3	19.5	21.5	17.5	22.3	22.0	26.8	26.7	21.7	26.3	24.7			24.5	24.3	23.0	28.7	26.7
9	TS (mg/L)						674	313	291	579	597	456	634						470	514	476	487	555	511	471								511	578	449	933	676
10	Turb (NTU)	3.6	9.0	10.2	4.3	14.4	10.8	12.5	21.0	5.2	11.0	5.3	9.6	1.0	1.0	1.0	2.0	1.0	1.0	1.3	1.0	2.0	1.3	1.3	1.3	1.0	1.3	1.0	1.7	1.3			1.0	1.0	1.0	1.7	1.7
	CHEMICAL																																			
1	Alk-Phen (mgCaCO3/L)	4.5	1.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	6.1	0.0	0.0	5.0	1.2	1.2	0.0	0.0	1.2	0.0	0.0	0.0	1.9	0.0	0.0	1.7	3.3	1.7	3.3	1.7			0.0	3.3	3.3	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	251	106	118	102	114	117	78	92	90	99	105	91	220	148	122	107	95	127	87	82	92	126	133	155	233	132	127	114	107			98	96	127	97	110
3	Ca (mg/L)	37	33	31	33	33	33	32	32	32	32	38	31	32	41	33	33	32	34	35	31	32	35	43	34	35	35	33	35	33			30	33	35	32	41
4	Cl (mg/L)	80.1	46.7	38.5	42.2	78.9	105.7	62.9	58.1	71.0	74.2	70.6	64.8	31.8	87.3	80.0	81.7	52.4	128.8	83.7	73.4	89.3	71.9	66.3	66.3	130.5	58.4	77.9	94.0	115.7			61.9	70.0	61.0	77.7	121.8
5	CO3 (mg/L)	5.4	1.2	1.2	0.0	0.0	3.6	0.0	0.0	0.0	7.4	0.0	0.0	6.0	1.5	1.5	0.0	0.0	1.5	0.0	0.0	0.0	2.3	0.0	0.0	2.0	4.0	2.0	4.0	2.0			0.0	4.0	4.0	0.0	0.0
6	F (mg/L)	0.26	0.19	0.19	0.15	0.22	0.19	0.16	0.21	0.17	0.17	0.12	0.11	0.23	0.05	0.05	0.28	0.27	0.18	0.23	0.21	0.15	0.15	0.13	0.14	0.22	0.05	0.05	0.35	0.35			0.17	0.17	0.13	0.13	0.11
7	HCO3 (mg/L)	295	127	142	124	139	135	95	113	110	106	128	111	256	178	146	130	116	152	107	100	113	149	162	189	280	153	151	131	126			120	109	147	118	134
8	K (mg/L)		0.9	9.1	0.7	6.2	8.9	6.9	7.6	5.1	3.8	4.2	4.0		0.9	6.5	2.0	3.5	16.7	10.3	2.3	4.4	3.7	4.3	3.6	0.3	3.8	0.8	2.7	7.7			2.9	3.6	3.9	3.7	14.5
9	Mg (mg/L)	9.3	8.0	7.4	7.2	10.1	8.4	6.9	6.6	6.9	8.5	6.6	7.7	7.1	11.0	8.5	10.0	7.8	9.5	7.3	7.1	7.0	14.7	8.2	21.4	10.7	11.3	7.1	11.7	10.7			7.4	8.0	12.1	8.1	9.2
10	Na (mg/L)		34.7	26.7	29.7	51.3	73.8	35.5	36.6	47.2	50.0	45.6	42.4		66.6	58.4	50.7	36.9	87.1	51.5	47.8	57.7	47.4	46.6	43.5	239.4	44.4	57.7	58.5	78.4			45.5	49.0	41.6	51.3	74.7
11	NH3-N (mg N/L)	0.14	0.15	0.08	0.10	0.14	0.15	0.12	0.13	0.10	0.12	0.11	0.18	0.19	0.06	0.06	0.19	0.14	0.12	0.06	0.09	0.12	0.14	0.13	0.12	0.20	0.05	0.06	0.24	0.21			0.10	0.13	0.13	0.10	0.12
12	NO2+NO3 (mg N/L)	0.58	0.06	0.25	0.20	0.27	0.29	0.26	0.21		0.18	0.19	0.17	0.46	0.01	0.06	0.31	0.29	0.27	0.22	0.25		0.19	0.20	0.19	0.53	0.03	0.09	0.43	0.39					0.20	0.17	0.17
13	NO2-N (mgN/L)	0.05	0.01	0.02	0.02	0.05	0.05	0.05	0.06		0.07	0.07	0.05	0.05	0.00	0.00	0.04	0.04	0.06	0.06	0.08		0.06	0.07	0.06	0.04	0.00	0.01	0.04	0.04					0.07	0.06	0.05
14	NO3-N (mgN/L)	0.52	0.05	0.23	0.18	0.23	0.23	0.21	0.15	0.12	0.11	0.12	0.11	0.41	0.01	0.06	0.26	0.25	0.21	0.16	0.17	0.12	0.13	0.13	0.13	0.50	0.03	0.08	0.38	0.35			0.16	0.10	0.13	0.12	0.12
15	o-PO4-P (mg P/L)						0.090	0.072	0.057										0.075	0.067	0.070																
16	P-Tot (mgP/L)	0.322	0.206	0.245	0.360	0.292	0.280	0.360	0.165	0.186	0.154	0.136	0.124	0.180	0.293	0.621	0.305	0.250	0.230	0.333	0.273	0.180	0.195	0.138	0.125	1.149	0.067	0.067	0.353	0.340			0.250	0.173	0.150	0.123	0.117
17	SiO2 (mg/L)	26.9	23.5	25.2	24.7	24.5	21.5	18.2	9.3	9.2	9.5	10.4	10.8	17.5	17.7	24.5	20.5	15.1	20.7	10.0	9.0	8.5	8.5	9.0	12.0	18.5	20.1	23.3	25.6	14.8			10.0	10.0	9.3	8.3	10.0
18	SO4 (mg/L)	27.6	15.5	7.0	12.3	16.9	8.9	15.2	10.3	10.8	12.5	7.8	10.4	24.4	34.7	11.0	19.2	16.9	11.0	15.5	15.1	11.2	12.5	9.5	11.0	30.8	23.8	6.3	21.8	20.8			11.0	11.7	7.0	10.3	12.7
	BIOLOGICAL/BACTERIOLOGICAL																																			
1	BOD3-27 (mg/L)	11.2	1.5	3.3	1.1	1.1	9.3	1.6	1.1	1.1	1.8	0.8	1.3	1.0	1.8	0.6	0.7	0.4	0.6	2.4	1.1	1.9	3.2	1.4	1.9	3.8	5.9	2.9	1.5	2.5			1.5	2.8	2.5	2.3	3.1
2	COD (mg/L)											57.0	56.0										60.0	36.0	36.0									40.3	38.7	65.3
3	DO (mg/L)		7.2							7.2	6.6	6.3	6.8		7.3			7.2				6.6	6.0	9.8	7.5		5.5			6.0				4.8	6.5	5.6
4	DO_SAT% (%)		92							90	80	82	85		87			79				76	63	106	86		64			70				57	79	69
5	FCol-MPN (MPN/100mL)										1400	540	1220									1200	825	850	800								1433	467	1500	1033
6	Tcol-MPN (MPN/100mL)										2980	1020	2720									5800	1675	1650	1600								3400	1033	3133	1400
	TRACE & TOXIC																																			
1	Al (mg/L)	0.10	0.10	0.08	0.08	0.11	0.12	0.10	0.12	0.09	0.09	0.08	0.08	0.04	0.02	0.06	0.11	0.04	0.09	0.08	0.11	0.11	0.08	0.08	0.08	0.06	0.07	0.05	0.14	0.09			0.12	0.10	0.08	0.08	0.08
	CHEMICAL INDICES																																			
1	HAR_Ca (mgCaCO3/L)	91	82	77	83	83	83	80	79	79	81	94	77	80	102	83	82	80	84	87	78	80	88	108	84	87	87	81	86	83			75	82	88	80	101
2	HAR_Total (mgCaCO3/L)	130	116	108	113	125	118	109	106	108	117	122	109	110	148	119	123	113	124	117	107	109	149	142	173	131	134	111	135	127			106	115	139	114	140
3	Na% (%)		25	31	34	43	42	38	39	46	48	44	45		39	50	43	40	56	46	49	52	40	42	35	78	39	53	47	55			48	47	41	48	48
4	RSC (-)	2.4	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.3	0.0	0.0			0.0	0.0	0.1	0.0	0.0
5	SAR (-)		1.3	1.1	1.2	2.0	3.0	1.5	1.5	2.0	2.0	1.9	1.8		2.1	2.3	2.0	1.5	3.4	2.1	2.0	2.4	1.7	1.8	1.5	8.7	1.6	2.4	2.2	3.1			1.9	2.0	1.6	2.1	2.7
	PESTICIDES																																			

POOLING CONDITION

POOLING CONDITION

Pesticides, Trace and Toxic element analysis

Station Name: Tapi at Burhanpur (01 02 17 002)
Local River: Tapi

Division: Tapi Division, surat
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	01.08.15	01.12.15	01.04.16	01.12.16	01.04.17	01.04.17
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, [illegible]	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, NRWQL, New Delhi	Analysis done by WQL-III Lab, 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 WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
1	As	Arsenic	microgram / l	-	-	-		0.0007		1.09			0.34	10.9	8.7		2.37	1.052				0.526	0.00027	0.00073	0.2618	0.00033	0.6325	0.002
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	0.00001	0.4	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	0.0041	0	0.006
4	Cu	Copper	microgram / l	-	-	-		-		17.55			60.23	12.75	5.3		45.47	-		6.150	0.011	-	0.0249	0.00298		0.00003	9.5	0.021
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	0.00532	2.8	0.004
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	0.00547	0	0.007
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	0.0014	10.03	0.032
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	-	-	-		-		-			-	-	-		-	-		-	-	-	–	–	–			

RIVER DRY

POOLING CONDITION

POOLING CONDITION

POOLING CONDITION

POOLING CONDITION

POOLING CONDITION

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	**:**	**2016-2017**
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 : 2016-2017

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	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	127.4	67.93	23.69	16.16	5.974	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	River Dry	Once in Two Months	2	Once in Two Months	Light	Once in Two Months	River Dry	Once in Two Months	River Dry	Once in Two Months	River Dry	Once in Two Months
3	EC_FLD (µmho/cm)												
4	EC_GEN (µmho/cm)			556		430							
5	Odour_Code (-)			odour free		odour free							
6	pH_FLD (pH units)												
7	pH_GEN (pH units)			7.6		8.2							
8	SS (mg/L)			150		200							
9	TDS (mg/L)			363		280							
10	Temp (deg C)			27.0		26.0							
11	TS (mg/L)			513		623							
12	Turb (NTU)			10.0		5.0							
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		0.0							
2	ALK-TOT (mgCaCO3/L)			100		150							
3	Ca (mg/L)			36		30							
4	Cl (mg/L)			70.0		70.0							
5	CO3 (mg/L)			0.0		0.0							
6	F (mg/L)			0.06		0.06							
7	HCO3 (mg/L)			122		183							
8	K (mg/L)			3.4		3.8							
9	Mg (mg/L)			7.3		19.7							
10	Na (mg/L)			48.0		52.0							
11	NH3-N (mg N/L)			0.05		0.26							
12	NO2+NO3 (mg N/L)			0.34		0.18							
13	NO2-N (mgN/L)			0.08		0.06							
14	NO3-N (mgN/L)			0.26		0.12							
15	P-Tot (mgP/L)			0.170		0.140							
16	SiO2 (mg/L)			5.0		15.0							
17	SO4 (mg/L)			10.0		8.0							
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)			0.8		1.4							
2	COD (mg/L)			8.0		56.0							
3	DO (mg/L)			600		700							
4	DO_SAT% (%)			1000		1300							
5	FCol-MPN (MPN/100mL)												
6	Tcol-MPN (MPN/100mL)												
	TRACE & TOXIC												
1	Al (mg/L)			0.05		0.11							
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			90		75							
2	HAR_Total (mgCaCO3/L)			121		157							
3	Na% (%)			46		41							
4	RSC (-)			0.0		0.0							
5	SAR (-)			1.9		1.8							
	PESTICIDES												

Water Quality Summary for the period :2016-2017

Station Name : Purna at Gopalkheda (01 02 17 004)
Local River: Purna

Division: Tapi Division, Surat
Sub-Division: UTSD, Bhusawal

River Water Summary

S.No	Parameters	Number of Observations	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	157	1168	0.000	64.02
2	EC_FLD (µmho/cm)				
3	EC_GEN (µmho/cm)	2	556	430	493
4	pH_FLD (pH units)				
5	pH_GEN (pH units)	2	8.2	7.6	7.9
6	SS (mg/L)	2	200	150	175
7	TDS (mg/L)	2	363	280	322
8	Temp (deg C)	2	27.0	26.0	26.5
9	TS (mg/L)	2	623	513	568
10	Turb (NTU)	2	10.0	5.0	7.5
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	2	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	2	150	100	125
3	Ca (mg/L)	2	36	30	33
4	Cl (mg/L)	2	70.0	70.0	70
5	CO3 (mg/L)	2	0.0	0.0	0
6	F (mg/L)	2	0.06	0.06	0.06
7	HCO3 (mg/L)	2	183	122	153
8	K (mg/L)	2	3.8	3.4	3.6
9	Mg (mg/L)	2	19.7	7.3	13.5
10	Na (mg/L)	2	52.0	48.0	50
11	NH3-N (mg N/L)	2	0.26	0.05	0.15
12	NO2+NO3 (mg N/L)	2	0.34	0.18	0.26
13	NO2-N (mgN/L)	2	0.08	0.06	0.07
14	NO3-N (mgN/L)	2	0.26	0.12	0.19
15	P-Tot (mgP/L)	2	0.170	0.140	0.155
16	SiO2 (mg/L)	2	15.0	5.0	10
17	SO4 (mg/L)	2	10.0	8.0	9
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	2	1.4	0.8	1.1
2	COD (mg/L)	2	56.0	8.0	32
3	FCol-MPN (MPN/100mL)	2	700	600	650
4	Tcol-MPN (MPN/100mL)	2	1300	1000	1150
	TRACE & TOXIC				
1	Al (mg/L)	2	0.11	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	2	90	75	83
2	HAR_Total (mgCaCO3/L)	2	157	121	139
3	Na% (%)	2	46	41	43
4	RSC (-)	2	0.0	0.0	0
5	SAR (-)	2	1.9	1.8	1.9
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2017

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

Local River: Purna Sub Division: UTSD, Bhusawal

S.No	Parameters	Flood												Winter											Summer										
		Jun - Oct												Nov - Feb											Mar - May										
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	487.5	37.74	478.6	9.465	7.690	282.0	48.18	158.6	277.2	26.26	7.503	58.81	1.300	3.979	4.010	2.517	1.753	3.125	0.407	1.685	5.975	5.576	0.000	5.974	0.000		1.204		0.000	0.000	0.000	0.000	1.172	0.000	0.000	0.000
2	EC_FLD (µmho/cm)				492	730					250						1644	638				1300								1105							
3	EC_GEN (µmho/cm)	556	281	554	1086	639	465	571	335	500	480	447	493	791	987	1364	2083	833	1084			1464	461	450		645	805	1198	2584	1222				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	8.3	8.3	7.9	8.1	8.3	8.2	7.9	8.0	8.0			8.4	8.4	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	175	77	232	262	488	242	401			516	210	150		79	266	318	528	402				220	200	160	
7	TDS (mg/L)	415	190	377	736	418	316	369	210	303	312	273	322	634	709	833	1315	504	795			930	300	290		441	552	804	1811	814				500	400	290	
8	Temp (deg C)	26.3	26.7	27.0	26.0	27.0	27.5	27.3	18.5	25.3	26.5	27.7	26.5	22.0	24.6	19.0	21.0	17.4	23.5			20.5	20.0	20.0		28.0	31.2	25.0	28.0	28.0				25.0	27.0	27.0	
9	TS (mg/L)						473	554	324	469	946	863	568						1196			1445	670	1530										720	600	1900	
10	Turb (NTU)	10.5	7.5	2.7	3.5	22.0	9.0	27.5	10.5	4.3	6.7	2.7	7.5		1.0	1.0	1.8	1.3	0.6			1.5	1.0	2.0		1.0	2.0	1.0	1.0	2.0				2.0	2.0	1.0	
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	2.5	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	0.0	5.0	2.5	0.0	2.5	0.0			5.0	11.6	0.0		0.0	5.0	5.0	0.0	0.0				11.6	0.0	0.0	
2	ALK-TOT (mgCaCO3/L)	142	137	128	125	107	88	87	77	88	111	123	125	205	207	167	161	90	110			116	93	100		180	159	153	184	100				109	221	100	
3	Ca (mg/L)	33	32	34	35	34	32	36	30	31	35	38	33	32	36	36	34	32	35			33	24	32		32	32	35	38	34				32	52	32	
4	Cl (mg/L)	127.7	16.7	82.3	144.8	113.5	86.0	135.2	105.2	76.0	64.0	55.7	70.0	141.1	168.3	150.6	370.7	171.3	234.6			92.5	60.0	67.0		94.7	143.4	167.0	460.0	250.3				60.0	48.0	60.0	
5	CO3 (mg/L)	3.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	6.0	3.0	0.0	3.0	0.0			6.0	14.0	0.0		0.0	6.0	6.0	0.0	0.0				14.0	0.0	0.0	
6	F (mg/L)	0.23	0.13	0.23	0.13	0.17	0.16	0.13	0.28	0.14	0.12	0.12	0.06	0.05	0.07	0.05	0.24	0.16	0.21			0.15	0.10	0.13		0.05	0.05	0.07	0.28	0.24				0.16	0.14	0.14	
7	HCO3 (mg/L)	167	126	152	152	130	107	106	95	108	117	150	153	250	240	198	197	104	134			130	85	122		219	182	175	224	122				104	270	122	
8	K (mg/L)		1.1	5.4	1.8	6.1	3.8	14.8	3.9	5.8	3.8	3.7	3.6		3.4	7.3	5.5	5.8	10.9			4.5	4.0	4.0			4.4	2.2	8.3	6.3				4.0	4.2	3.8	
9	Mg (mg/L)	9.1	8.7	7.8	8.9	10.7	8.3	8.1	6.4	6.9	9.9	10.1	13.5	8.3	12.4	8.9	9.5	7.8	8.9			7.8	7.3	6.1		6.8	7.8	8.7	12.7	10.2				7.8	17.3	3.7	
10	Na (mg/L)		12.1	57.4	98.8	73.7	51.4	77.7	65.2	50.6	44.4	39.7	50.0		128.0	114.0	240.8	108.3	147.4			67.5	46.2	52.0			106.9	128.8	286.0	165.0				46.0	37.0	46.0	
11	NH3-N (mg N/L)	0.14	0.61	0.05	0.14	0.16	0.09	0.08	0.12	0.11	0.11	0.12	0.15	0.05	0.05	0.08	0.13	0.09	0.08			0.11	0.12	0.12		0.05	0.05	0.08	0.20	0.19				0.16	0.12	0.10	
12	NO2+NO3 (mg N/L)	0.47	0.04	0.10	0.29	0.31	0.30	0.25	0.16		0.19	0.20	0.26	0.03	0.01	0.08	0.23	0.24	0.26				0.22	0.18		0.07	0.04	0.21	0.52	0.34					0.17	0.23	
13	NO2-N (mgN/L)	0.03	0.00	0.03	0.04	0.05	0.11	0.05	0.04		0.09	0.08	0.07	0.00	0.00	0.00	0.04	0.05	0.04				0.08	0.05		0.00	0.01	0.03	0.02	0.04					0.05	0.10	
14	NO3-N (mgN/L)	0.44	0.04	0.08	0.26	0.27	0.19	0.20	0.13	0.11	0.11	0.12	0.19	0.03	0.01	0.08	0.19	0.19	0.23			0.14	0.14	0.13		0.07	0.03	0.18	0.50	0.30				0.10	0.12	0.13	
15	o-PO4-P (mg P/L)						0.080	0.055	0.070										0.070																	
16	P-Tot (mgP/L)	0.569	0.474	0.087	0.267	0.253	0.170	0.380	0.210	0.193	0.173	0.143	0.155	0.070	0.045	0.233	0.395	0.215	0.180			0.180	0.160	0.150		0.120	0.040	0.080	0.420	0.300				0.180	0.140	0.140	
17	SiO2 (mg/L)	24.2	21.4	23.3	27.3	24.9	14.7	19.4	9.0	8.3	9.3	5.7	10.0	18.4	21.8	27.4	25.2	16.3	10.0			10.0	6.8	8.0		22.4	22.4	26.9	25.8	15.7				8.0	10.0	10.0	
18	SO4 (mg/L)	9.0	14.1	5.1	26.5	19.2	4.1	12.5	15.0	10.9	16.3	15.0	9.0	22.2	16.0	30.1	18.0	16.5	6.8			12.2	10.0	10.0		13.7	8.7	20.3	20.5	24.5				14.0	3.0	10.0	
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	1.1	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	11.5				1.3	3.8	0.8	
2	COD (mg/L)											18.7	32.0										32.0	52.0										20.0	28.0	
3	DO (mg/L)				7.7	7.7				7.0	5.2						7.7	6.6					7.0							5.9					5.3		
4	DO_SAT% (%)				95	97				83	64						94	65					77							75					67		
5	FCol-MPN (MPN/100mL)										433	467	650									900	300	800										600	300	500	
6	Tcol-MPN (MPN/100mL)										1000	900	1150									2500	800	1200										1400	700	1200	
	TRACE & TOXIC																																				
1	Al (mg/L)	0.09	0.08	0.06	0.10	0.07	0.15	0.14	0.09	0.09	0.12	0.08	0.08	0.04	0.05	0.08	0.07	0.05	0.11			0.09	0.12	0.11		0.06	0.06	0.04	0.04	0.10				0.16	0.10	0.09	
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	81	80	84	88	84	80	89	75	77	88	95	83	80	90	90	85	80	86			83	60	80		80	80	88	95	85				80	129	80	
2	HAR_Total (mgCaCO3/L)	119	117	116	125	129	114	123	102	105	130	137	139	115	142	127	124	113	124			115	91	105		108	113	124	148	127				113	201	95	
3	Na% (%)		18	50	54	53	34	55	55	48	42	39	43		66	65	79	65	70			54	51	51			66	69	80	73				46	28	50	
4	RSC (-)	0.5	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.3	0.8	0.8	0.0	0.4			0.1	0.1	0.0		1.4	0.9	0.6	0.7	0.0				0.0	0.4	0.1	
5	SAR (-)		0.5	2.3	3.7	2.8	2.0	3.1	2.8	2.1	1.7	1.5	1.9		4.7	4.4	9.4	4.4	5.8			2.8	2.1	2.2			4.4	5.0	10.3	6.4				1.9	1.1	2.1	
	PESTICIDES																																				

Pooling Condition / Sample not received

Pooling Condition / Sample not received

Once in 2 months/ River Dry

Pooling Condition

Pooling Condition

Pooling Condition

Once in 2 months/ River Dry

Pesticides, Trace and Toxic element analysis

Station Name: Purna at Gopalkheda (01 02 17 004)
Local River: Purna

Division: Tapi Division, surat
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	01.12.16	01.04.17	01.04.17
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	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	River Dry	River dry	River dry
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		-			-	-			-	-		-		-						
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	**:**	**2016-2017**
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 : 2016-2017

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	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	18.25	608.6	18.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)			Clear		Light		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)			100		250		350		300		300	
4	EC_GEN (µmho/cm)			266		334		379		332		462	
5	Odour_Code (-)			1		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)			7.6		8.0		8.0		8.3		8.2	
7	pH_GEN (pH units)			7.2		8.2		8.3		8.3		8.2	
8	SS (mg/L)			90		110		110		100		160	
9	TDS (mg/L)			172		217		244		215		300	
10	Temp (deg C)			22.0		21.0		14.5		15.0		20.0	
11	TS (mg/L)			262		327		354		315		430	
12	Turb (NTU)			10.0		1.0		1.0		1.0		1.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)			0.0		0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)			90		73		110		150		140	
3	Mg (mg/L)			30		33		24		32		36	
4	Na (mg/L)			60.0		100.0		68.0		65.0		55.0	
5	CO3 (mg/L)			0.0		0.0		0.0		0.0		0.0	
6	F (mg/L)	River	Once in	0.08	Once in	0.14	Once in	0.13	Once in	0.12	Once in Two	0.13	Once in Two
7	HCO3 (mg/L)	Dry	Two	110	Two	89	Two	134	Two	183	Months	171	Months
8	K (mg/L)		Months	3.8	Months	3.6	Months	3.6	Months	4.2		3.3	
9				6.1		5.7		13.4		20.7		12.1	
10				42.0		56.0		46.0		44.5		42.0	
11	NH3-N (mg N/L)			0.08		0.30		0.12		0.11		0.12	
12	NO2+NO3 (mg N/L)			0.20		0.21		0.20		0.18		0.16	
13	NO2-N (mgN/L)			0.10		0.08		0.08		0.06		0.04	
14	NO3-N (mgN/L)			0.10		0.13		0.12		0.12		0.12	
15	P-Tot (mgP/L)			0.120		0.120		0.110		0.140		0.130	
16	SiO2 (mg/L)			10.0		6.0		10.0		11.0		10.0	
17	SO4 (mg/L)			4.0		12.0		11.0		6.0		5.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)			1.4		1.0		2.0		2.2		4.3	
2	COD (mg/L)			36.0		28.0		20.0		80.0		20.0	
3	DO (mg/L)			12.0		8.5		8.8		7.5		7.7	
4	DO_SAT% (%)			137		95		86		74		85	
5	FCol-MPN (MPN/100mL)			500		1200		600		300		1800	
6	Tcol-MPN (MPN/100mL)			1400		2000		1400		600		3400	
	TRACE & TOXIC												
1	Al (mg/L)			0.06		0.12		0.06		0.11		0.12	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)			75		82		60		80		90	
2	HAR_Total (mgCaCO3/L)			100		105		116		166		140	
3	Na% (%)			47		53		46		36		39	
4	RSC (-)			0.0		0.0		0.0		0.0		0.0	
5	SAR (-)			1.8		2.4		1.9		1.5		1.5	
	PESTICIDES												

Water Quality Summary for the period :2016-2017

Station Name : Tapi at Sarangkheda (01 02 17 015)
Local River: Tapi

Division: Tapi Division, Surat
Sub-Division: MTSD, Dhule

River Water Summary

S.No	Parameters	Number of	Maximum	Minimum	Mean
	PHYSICAL				
1	Q (cumec)	335	5701	0.000	187.5
2	EC_FLD (µmho/cm)	5	350	100	260
3	EC_GEN (µmho/cm)	5	462	266	355
4	pH_FLD (pH units)	5	8.3	7.6	8
5	pH_GEN (pH units)	5	8.3	7.2	8
6	SS (mg/L)	5	160	90	114
7	TDS (mg/L)	5	300	172	230
8	Temp (deg C)	5	22.0	14.5	18.5
9	TS (mg/L)	5	430	262	338
10	Turb (NTU)	5	10.0	1.0	2.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	5	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	5	150	73	113
3	Ca (mg/L)	5	36	24	31
4	Cl (mg/L)	5	100.0	55.0	69.6
5	CO3 (mg/L)	5	0.0	0.0	0
6	F (mg/L)	5	0.14	0.08	0.12
7	HCO3 (mg/L)	5	183	89	137
8	K (mg/L)	5	4.2	3.3	3.7
9	Mg (mg/L)	5	20.7	5.7	11.6
10	Na (mg/L)	5	56.0	42.0	46.1
11	NH3-N (mg N/L)	5	0.30	0.08	0.15
12	NO2+NO3 (mg N/L)	5	0.21	0.16	0.19
13	NO2-N (mgN/L)	5	0.10	0.04	0.07
14	NO3-N (mgN/L)	5	0.13	0.10	0.12
15	P-Tot (mgP/L)	5	0.140	0.110	0.124
16	SiO2 (mg/L)	5	11.0	6.0	9.4
17	SO4 (mg/L)	5	12.0	4.0	7.6
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	5	4.3	1.0	2.2
2	COD (mg/L)	5	80.0	20.0	36.8
3	DO (mg/L)	5	12.0	7.5	8.9
4	DO_SAT% (%)	5	137	74	95
5	FCol-MPN (MPN/100mL)	5	1800	300	880
6	Tcol-MPN (MPN/100mL)	5	3400	600	1760
	TRACE & TOXIC				
1	Al (mg/L)	5	0.12	0.06	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	5	90	60	77
2	HAR_Total (mgCaCO3/L)	5	166	100	126
3	Na% (%)	5	53	36	44
4	RSC (-)	5	0.0	0.0	0
5	SAR (-)	5	2.4	1.5	1.8
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2017

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

Local River: Tapi Sub Division: MTSD, Dhule

S.No	Parameters	Flood												Winter												Summer											
		Jun - Oct												Nov - Feb												Mar - May											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	178.9	1552	2676	336.9	270.0	913.0	420.5	566.5	485.8	446.0	54.56	161.3	1.685	23.7	10.96	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)			380	370	188	270			325	305	300	175			334						300	300	350	325									400	300	300	300
3	EC_GEN (µmho/cm)	281	287	367	362	282	318	299	320	413	425	417	300		391	359						460	410	368	356		326							630	444	280	462
4	pH_FLD (pH units)			8.5	10.5	9.8	8.6	7.0	7.2	8.1	7.6	6.8	7.8			7.0						8.6	7.0	6.9	8.2									6.8	7.0	7.1	8.2
5	pH_GEN (pH units)	8.3	8.1	8.3	7.9	7.6	8.0	7.6	8.2	8.0	8.6	8.1	7.7		8.6	8.6						8.3	8.1	7.8	8.3		8.7							8.1	8.2	8.3	8.2
6	SS (mg/L)	66	86	110	146	102	122	90	98	150	130	145	100		144	109						150	150	90	105		98							200	120	100	160
7	TDS (mg/L)	186	192	294	237	184	215	168	210	269	277	269	195		295	222						314	265	235	230		229							399	286	180	300
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	21.5		22.0	17.0						19.0	14.5	14.5	14.8		25.0							21.0	21.0	18.0	20.0
9	TS (mg/L)						337	258	308	419	407	807	295									464	470	563	335									599	406	558	430
10	Turb (NTU)						11.1	16.0	8.0	3.0	22.0	1.5	5.5									1.0	1.5	1.0	1.0									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	0.0		5.0	5.0						5.0	7.1	0.0	0.0		5.0							5.8	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	120	170	222	170	190	112	66	95	90	109	111	82		170	210						95	92	87	130		190							112	180	115	140
3	Ca (mg/L)	32	32	32	32	32	31	30	32	31	35	40	31		32	32						32	26	32	28		32							36	26	32	36
4	Cl (mg/L)	15.3	14.4	57.0	46.5	59.1	55.6	104.9	68.8	71.3	60.5	73.0	80.0		2.3	56.1						98.0	62.3	75.0	66.5		6.9							58.0	65.0	55.0	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	0.0		6.0	6.0						6.0	8.5	0.0	0.0		6.0							7.0	0.0	0.0	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	0.11		0.08	0.08						0.15	0.16	0.14	0.12		0.08							0.18	0.13	0.14	0.13
7	HCO3 (mg/L)	146	104	134	102	116	137	80	116	110	103	136	100		98	122						104	96	106	159		110							122	220	140	171
8	K (mg/L)		0.6	20.5	0.7	3.7	17.6	12.4	3.2	5.7	3.6	3.3	3.7		3.2	5.6						4.8	4.4	4.0	3.9		3.5							4.2	4.0	4.2	3.3
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	5.9		8.9	7.8						7.8	10.2	8.5	17.0		6.8							8.8	31.1	9.7	12.1
10	Na (mg/L)		8.8	34.9	27.7	38.8	36.0	58.7	45.0	44.6	44.1	42.0	49.0		1.3	40.7						70.0	43.5	40.3	45.3		4.0							40.0	40.0	40.0	42.0
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	0.19		0.07	0.07						0.10	0.12	0.12	0.11		0.07							0.12	0.12	0.13	0.12
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	0.20		0.04	0.04						0.20	0.19	0.21	0.19		0.04								0.21	0.21	0.16
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	0.09		0.00	0.00						0.10	0.08	0.08	0.07		0.00								0.10	0.08	0.04
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	0.11		0.04	0.04						0.10	0.11	0.13	0.12		0.04							0.12	0.11	0.13	0.12
15	o-PO4-P (mg P/L)						0.075	0.090	0.050																												
16	P-Tot (mgP/L)	0.482	0.125	0.113	0.360	0.120	0.095	0.360	0.100	0.207	0.160	0.130	0.120		0.080	0.139						0.180	0.160	0.140	0.125		0.060							0.160	0.150	0.130	0.130
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	8.0		24.5	24.3						12.0	9.2	8.0	10.5		14.4							8.5	6.6	10.0	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	8.0		16.3	2.9						16.6	14.2	6.5	8.5		6.1							12.0	10.0	6.0	5.0
	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	1.2		3.0	1.6						2.5	2.4	2.8	2.1		1.4							2.4	4.0	1.0	4.3
2	COD (mg/L)											58.0	32.0										24.0	20.0	50.0										21.0	16.0	20.0
3	DO (mg/L)			5.5	6.8	15.0	10.5			9.0	7.2	7.2	10.3			1.6						9.8	9.0	6.5	8.1									10.2	8.3	6.7	7.7
4	DO_SAT% (%)			69	83	184	129			103	86	89	116			17						106	88	64	80									114	93	71	85
5	FCol-MPN (MPN/100mL)										450	750	850									800	550	1500	450									700	800	300	1800
6	Tcol-MPN (MPN/100mL)										1050	1600	1700									2500	900	2900	1000									1600	1700	500	3400
	TRACE & TOXIC																																				
1	Al (mg/L)						0.06	0.05	0.10	0.13	0.09	0.06	0.09									0.08	0.08	0.08	0.08									0.10	0.10	0.10	0.12
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	80	80	80	80	80	78	75	80	78	88	100	78		80	80						80	65	80	70		80							90	64	80	90
2	HAR_Total (mgCaCO3/L)	112	108	106	108	114	113	99	105	108	111	141	103		117	113						112	108	116	141		108							127	194	121	140
3	Na% (%)		15	36	35	41	30	53	47	45	46	40	50		2	43						56	46	42	41		7							40	31	41	39
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	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	2.1		0.1	1.7						2.9	1.8	1.6	1.7		0.2							1.5	1.3	1.6	1.5
	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	01.12.16	01.04.17	1.04.17
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 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	0.00027	0.002	1.1913
2	Cd	Cadmium	microgram / l		-					0.157							0.552	0.00		0.246		1.000	0.00014	0	0	0.00001	0	0
3	Cr	Chromium	microgram / l		-					5.5							17.01	0.00		11.570		0.000	0.02028	0.00064	0	0.00378	0.032	0
4	Cu	Copper	microgram / l		-					23.38							32.51	-		12.270		-	0.00316	0.00063		0.00279	0.014	4.3
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	0.00203	0.006	6.4
7	Pb	Lead	microgram / l		-					4.74							0.95	69.30		0.600		11.000	0.00119	0	0	0.00056	0.062	0
8	Zn	Zinc	microgram / l		-					32.29							0.15	43.70		0.014		0.000	0.00436	0.0054	13.62	0.0194	0.013	7.64
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

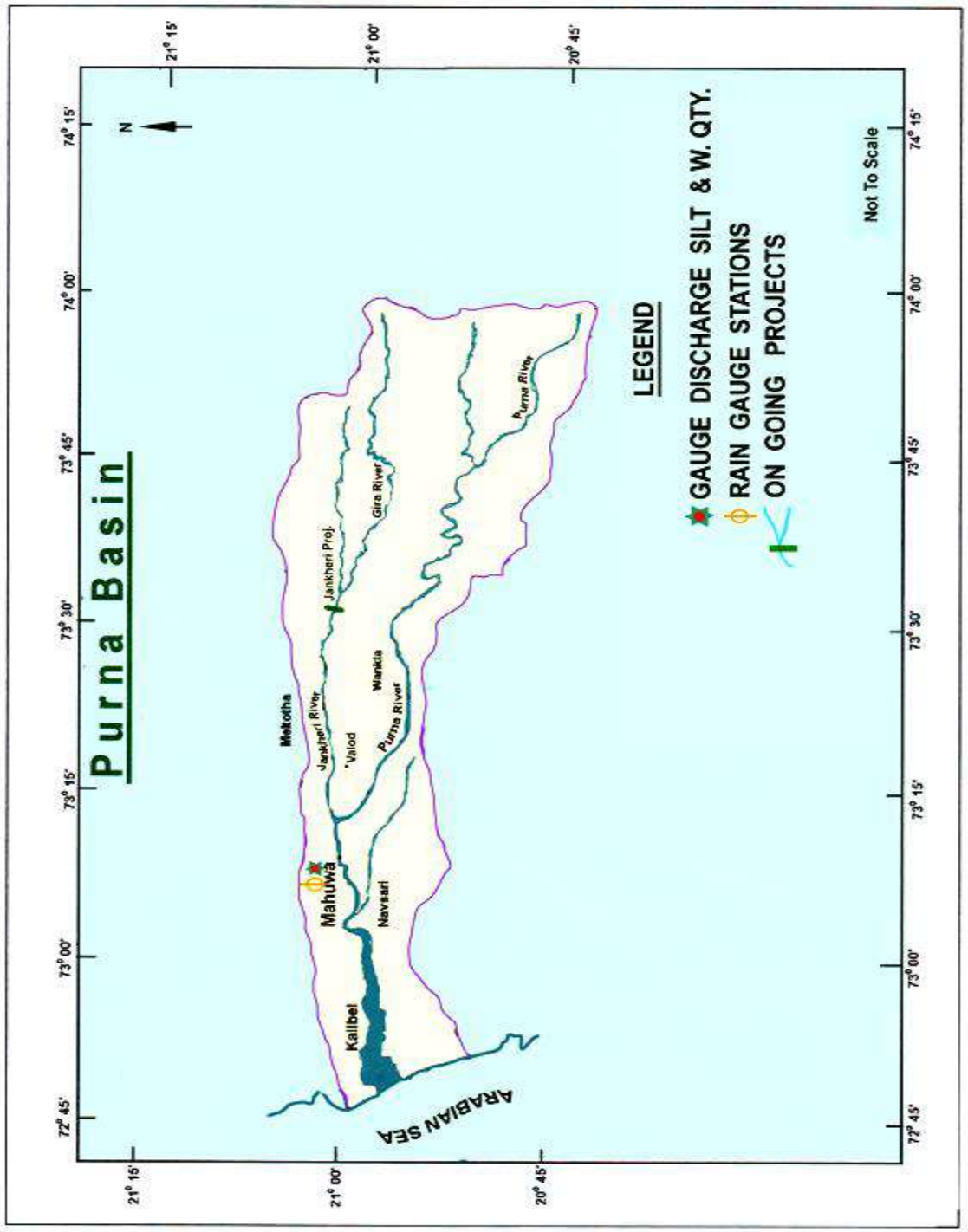
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

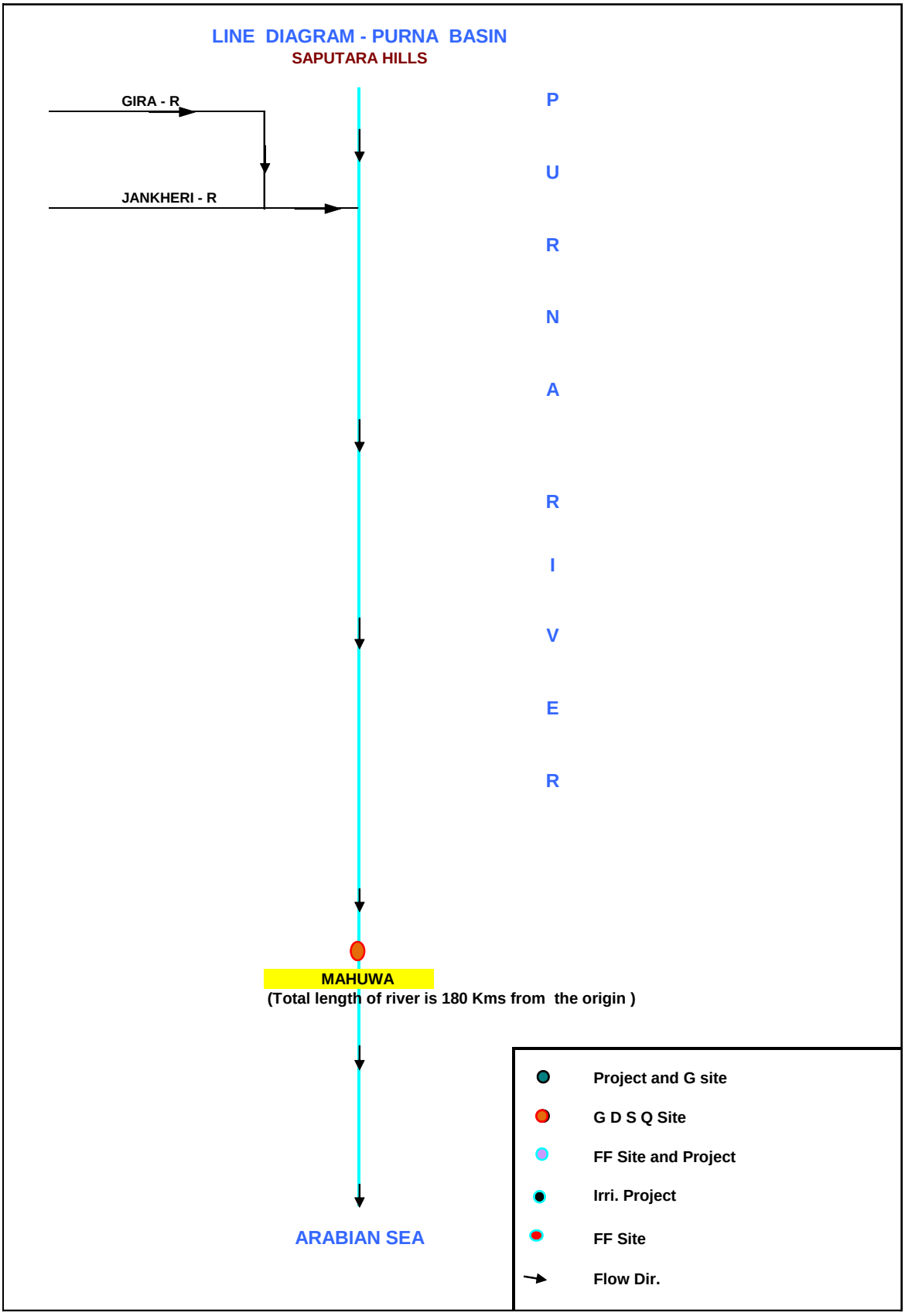
8. PURNA BASIN

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.

HISTORY SHEET

			Water Year	**:**	**2016-2017**
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 : 2016-2017

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	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	135.5	21.29	27.76	2.989	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		2		Light		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	436		590		305		285		436		410	
4	EC_GEN (µmho/cm)	477		297		383		502		600		440	
5	Odour_Code (-)	odour free		1		odour free		odour free		odour free		odour free	
6	pH_FLD (pH units)	7.0		7.0		8.0		7.0		8.2		7.0	
7	pH_GEN (pH units)	8.2		7.7		8.2		8.2		8.2		8.2	
8	SS (mg/L)	170		100		120		165		180		155	
9	TDS (mg/L)	310		195		249		322		388		286	
10	Temp (deg C)	23.0		24.0		24.0		19.0		16.0		24.0	
11	TS (mg/L)	480		295		369		487		568		441	
12	Turb (NTU)	1.0		16.0		1.0		2.0		1.0		1.0	
	CHEMICAL												
1	Alk-Phen (mgCaCO3/L)	0.0		0.0		0.0		0.0		0.0		0.0	
2	ALK-TOT (mgCaCO3/L)	110		115		100		110		190		130	
3	Ca (mg/L)	32		38		34		28		40		40	
4	Cl (mg/L)	70.0		70.0		65.0		75.0		67.0		79.0	
5	CO3 (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
6	F (mg/L)			0.10		0.11		0.15		0.12		0.12	
7	HCO3 (mg/L)	134		140		122		134		232		159	
8	K (mg/L)	3.8	Once in Two Months	4.0	Once in Two Months	4.0	Once in Two Months	4.0	Once in Two Months	4.5	Once in Two Months	4.8	Once in Two Months
9	Mg (mg/L)	9.7		8.5		5.0		18.2		24.3		9.7	
10	Na (mg/L)	46.0		46.0		50.0		46.0		48.2		54.0	
11	NH3-N (mg N/L)	0.12		0.10		0.18		0.12		0.12		0.13	
12	NO2+NO3 (mg N/L)	0.23		0.13		0.22		0.22		0.17		0.18	
13	NO2-N (mgN/L)	0.10		0.05		0.08		0.08		0.05		0.06	
14	NO3-N (mgN/L)	0.13		0.08		0.14		0.14		0.12		0.12	
15	P-Tot (mgP/L)	0.140		0.110		0.150		0.120		0.140		0.120	
16	SiO2 (mg/L)	8.0		10.0		10.0		8.0		12.0		10.0	
17	SO4 (mg/L)	10.0		8.0		10.0		16.0		8.0		8.0	
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	1.0		1.0		2.0		0.8		1.6		1.6	
2	COD (mg/L)	76.0		20.0		28.0		8.0		30.0		8.0	
3	DO (mg/L)	6.2		8.2		6.4		8.0		7.3		6.7	
4	DO_SAT% (%)	72		97		76		86		74		79	
5	FCol-MPN (MPN/100mL)	1000		700		1400		900		400		800	
6	Tcol-MPN (MPN/100mL)	1600		1400		3200		2000		600		1600	
	TRACE & TOXIC												
1	Al (mg/L)	0.11		0.07		0.12		0.05		0.10		0.12	
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	80		95		85		70		100		100	
2	HAR_Total (mgCaCO3/L)	121		131		106		146		201		141	
3	Na% (%)	44		43		50		40		34		45	
4	RSC (-)	0.0		0.0		0.0		0.0		0.0		0.0	
5	SAR (-)	1.8		1.8		2.1		1.7		1.5		2.0	
	PESTICIDES												

Water Quality Summary for the period 2016-2017

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	1048	0.000	28.75
2	EC_FLD (µmho/cm)	6	590	285	410
3	EC_GEN (µmho/cm)	6	600	297	450
4	pH_FLD (pH units)	6	8.2	7.0	7.4
5	pH_GEN (pH units)	6	8.2	7.7	8.1
6	SS (mg/L)	6	180	100	148
7	TDS (mg/L)	6	388	195	292
8	Temp (deg C)	6	24.0	16.0	21.7
9	TS (mg/L)	6	568	295	440
10	Turb (NTU)	6	16.0	1.0	3.7
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	190	100	126
3	Ca (mg/L)	6	40	28	35
4	Cl (mg/L)	6	79.0	65.0	71
5	CO3 (mg/L)	6	0.0	0.0	0
6	F (mg/L)	5	0.15	0.10	0.12
7	HCO3 (mg/L)	6	232	122	154
8	K (mg/L)	6	4.8	3.8	4.2
9	Mg (mg/L)	6	24.3	5.0	12.6
10	Na (mg/L)	6	54.0	46.0	48.4
11	NH3-N (mg N/L)	6	0.18	0.10	0.13
12	NO2+NO3 (mg N/L)	6	0.23	0.13	0.19
13	NO2-N (mgN/L)	6	0.10	0.05	0.07
14	NO3-N (mgN/L)	6	0.14	0.08	0.12
15	P-Tot (mgP/L)	6	0.150	0.110	0.13
16	SiO2 (mg/L)	6	12.0	8.0	9.7
17	SO4 (mg/L)	6	16.0	8.0	10
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	2.0	0.8	1.3
2	COD (mg/L)	6	76.0	8.0	28.3
3	DO (mg/L)	6	8.2	6.2	7.1
4	DO_SAT% (%)	6	97	72	81
5	FCol-MPN (MPN/100mL)	6	1400	400	867
6	Tcol-MPN (MPN/100mL)	6	3200	600	1733
	TRACE & TOXIC				
1	Al (mg/L)	6	0.12	0.05	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	100	70	89
2	HAR_Total (mgCaCO3/L)	6	201	106	141
3	Na% (%)	6	50	34	42
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.1	1.5	1.8
	PESTICIDES				

Water Quality seasonal Average for the period:2005-2017

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	Flood												Winter												Summer											
		Jun - Oct												Nov - Feb												Mar - May											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	804.3	122.3	646.9	35.48	23.32	61.68	84.75	159.8	54.17	80.16	12.73	36.90	4.275	4.568	4.640	5.805	2.152	5.099	1.658	3.092	3.434	0.000	0.000	0.747	1.703	2.113	2.561	2.704	0.000	0.182	0.320	1.267	0.000	0.000	0.000	0.000
2	EC_FLD (µmho/cm)		214	306	272	371	292		395		240	372	444	413	400	447	451	363	425				438		361	418	362	382	435						438		410
3	EC_GEN (µmho/cm)	293	311	375	392	440	432	376	399	388	372	323	386	395	463	664	505	400	432	532	325	538	350	490	551	443	499	460	443			600		780	560	500	440
4	pH_FLD (pH units)		8.1	8.2	7.0	7.0	7.0		7.0	7.0	8.0	7.9	7.3	8.0	8.3	7.8	7.0	7.0	7.6	7.0	7.2	8.2	7.0	7.3	7.6	7.1	8.2	7.7	7.0			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	8.3	8.0	8.0	8.3	8.3	8.0	7.9	7.8	8.1	7.3	8.1	7.9	8.0	8.2	8.2	8.2	8.6	8.3	8.3			7.6		6.8	7.8	8.1	8.2
6	SS (mg/L)	65	101	158	138	175	163	128	153	138	129	115	130	77	132	179	188	154	152	185	129	163	130	175	173	85	121	117	176			170		220	300	110	155
7	TDS (mg/L)	204	155	288	264	292	312	220	278	255	255	206	251	275	342	383	319	265	294	324	260	347	243	315	355	294	364	306	309			500		505	360	310	286
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	23.7	21.5	20.5	21.0	21.5	22.0	24.0	20.5	22.0	23.0	23.5	23.5	17.5	25.0	29.0	26.0	23.0			21.5		26.0	26.0	23.0	24.0
9	TS (mg/L)						475	367	432	485	374	660	381						445	508	389	510	433	1075	528							516		725	984	604	441
10	Turb (NTU)						1.7	16.5	10.3	3.0	2.7	2.7	6.0						1.5	1.5	1.0	2.0	2.0	1.5	1.5							2.0		1.0	1.0	2.0	1.0
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	2.0	2.5	5.0	1.7	1.7	0.0	0.0	0.0	0.0	3.9	0.0	0.0	2.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0	2.5	10.8	0.0	0.0	0.0	5.0	0.0	5.0			0.0		5.8	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	150	174	223	183	190	101	92	92	72	98	110	108	305	165	175	260	110	90	75	76	99	118	81	150	440	230	200	190			90		110	151	110	130
3	Ca (mg/L)	32	31	32	33	32	31	33	33	28	35	33	35	32	32	32	33	32	32	31	34	32	38	37	34	32	34	32	32			34		38	34	36	40
4	Cl (mg/L)	22.4	10.5	59.4	30.2	159.0	90.0	90.7	188.5	79.0	76.0	72.7	68.3	72.5	33.7	45.6	100.7	60.1	137.7	96.4	93.7	98.5	65.2	85.0	71.0	52.1	10.1	23.2	204.6			220.6		68.0	68.0	65.0	79.0
5	CO3 (mg/L)	1.3	3.0	6.0	2.0	2.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	1.5	3.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	13.0	0.0	0.0	0.0	6.0	0.0	6.0			0.0		7.0	0.0	0.0	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	0.11	0.13	0.05	0.05	0.19	0.14	0.07	0.08	0.10	0.14	0.18	0.12	0.14	0.22	0.05	0.05	0.22			0.14		0.14	0.14	0.14	0.12
7	HCO3 (mg/L)	183	103	130	110	114	123	112	112	87	110	134	132	256	98	104	158	134	110	91	93	115	118	99	183	268	134	122	110			110		120	184	134	159
8	K (mg/L)		0.2	14.9	0.2	19.9	9.5	11.5	5.1	2.8	4.1	3.9	3.9		0.7	3.9	18.2	2.3	4.8	4.0	3.6	4.4	4.2	4.2	4.3		4.0	0.3	26.0			8.8		3.6	3.6	4.4	4.8
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	7.7	8.3	7.8	7.8	8.7	7.8	8.5	9.0	8.0	9.6	9.9	7.9	21.3	7.8	8.7	6.8	8.7			6.6		8.0	16.8	7.3	9.7
10	Na (mg/L)		6.0	36.0	17.5	95.8	64.1	53.5	122.6	47.7	49.1	48.7	47.3		18.5	25.8	71.7	43.4	98.0	52.0	58.8	64.0	43.4	45.0	47.1		7.4	15.1	118.6			132.7		48.0	48.2	44.0	54.0
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	0.13	0.05	0.05	0.06	0.05	0.07	0.10	0.07	0.13	0.14	0.11	0.12	0.19	0.05	0.05	0.18			0.10		0.18	0.11	0.12	0.13
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	0.19	0.06	0.02	0.02	0.04	0.03	0.11	0.14	0.14	0.22	0.21	0.16	0.20	0.08	0.01	0.01	0.06			0.12			0.21	0.21	0.18
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	0.08	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.04	0.10	0.06	0.04	0.06	0.00	0.00	0.00	0.00			0.01			0.08	0.10	0.06
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	0.12	0.06	0.02	0.02	0.04	0.03	0.08	0.11	0.10	0.13	0.15	0.11	0.13	0.08	0.01	0.01	0.06			0.11		0.14	0.13	0.11	0.12
15	o-PO4-P (mg P/L)						0.047	0.080	0.087										0.050	0.055	0.050											0.160					
16	P-Tot (mgP/L)	0.410	0.086	0.100	0.305	0.127	0.093	0.325	0.133	0.187	0.160	0.123	0.133	0.146	0.050	0.175	0.130	0.080	0.090	0.320	0.450	0.200	0.220	0.120	0.130	0.160	0.040	0.036	0.220			0.360		0.200	0.130	0.140	0.120
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	9.3	14.3	14.3	22.3	16.6	12.8	16.4	15.1	13.0	8.4	8.4	8.0	10.0	14.9	15.1	20.2	18.3			8.0		7.2	10.0	6.0	10.0
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	9.3	20.3	13.7	9.0	14.8	12.1	10.4	7.4	19.2	15.3	8.4	9.0	12.0	23.9	4.2	4.0	14.4			10.0		15.0	10.0	6.0	8.0
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	1.3	0.7	0.8	1.0	0.6	0.4	1.4	0.7	1.3	1.7	1.7	1.6	1.2	0.4	1.6	2.1	0.7			0.5		3.3	4.4	1.8	1.6
2	COD (mg/L)											64.0	41.3										20.0	40.0	19.0									34.0	8.0	8.0
3	DO (mg/L)		6.0	6.7	8.8	7.3	7.8		8.0	7.4	6.7	7.0	6.9		6.6		5.3	7.2	9.0			7.2	7.7	6.8	7.7		6.6	6.2	5.0						6.0	6.9	6.7
4	DO_SAT% (%)		76	94	111	95	100		103	93	86	88	82		73		59	82	103			87	92	80	80		86	76	58						74	80	79
5	FCol-MPN (MPN/100mL)										550	533	1033									1000	175	1300	650								1600	500	1500	800
6	Tcol-MPN (MPN/100mL)										1133	1267	2067									2200	400	2800	1300								3800	1500	3400	1600
	TRACE & TOXIC																																				
1	Al (mg/L)						0.05	0.08	0.12	0.07	0.10	0.10	0.10						0.06	0.14	0.09	0.09	0.09	0.11	0.08							0.08		0.18	0.06	0.10	0.12
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	80	78	80	81	80	78	83	82	70	88	82	87	80	80	80	82	80	80	78	85	80	94	93	85	80	84	80	80			85		95	86	90	100
2	HAR_Total (mgCaCO3/L)	113	109	114	107	113	108	112	110	103	115	129	119	115	113	112	118	113	115	115	118	120	135	126	174	113	120	108	116			113		129	156	121	141
3	Na% (%)		11	37	26	51	49	48	57	48	47	44	46		21	31	48	45	61	49	51	53	40	43	37		11	23	63			70		44	40	43	45
4	RSC (-)	1.2	0.0	0.1	0.0	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	0.0	2.2	0.0	0.0	0.0			0.0		0.0	0.0	0.0	0.0
5	SAR (-)		0.3	1.5	0.7	3.9	2.7	2.2	5.1	2.0	2.0	1.9	1.9		0.8	1.1	2.9	1.8	4.0	2.1	2.4	2.5	1.6	1.8	1.6		0.3	0.6	4.8			5.5		1.8	1.7	1.7	2.0
	PESTICIDES																																				

Once in 2 months / Sample not received

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	01.12.16	01.04.17	01.04.17
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	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	0.00024	0.001	0.4088
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	0.00005	0	1.5
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	0.0342	0.008	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		0.0146	0.012	6.1
5	Hg	Mercury	microgram / l	-	-	0	-	-		0.52	-	0.1075	-	-	0.98		0.54	0.137		-	-	0.021			0.233			0
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	0.00373	0.003	3.5
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	0.00463	0.004	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	0.0003	0.017	6.99
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	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

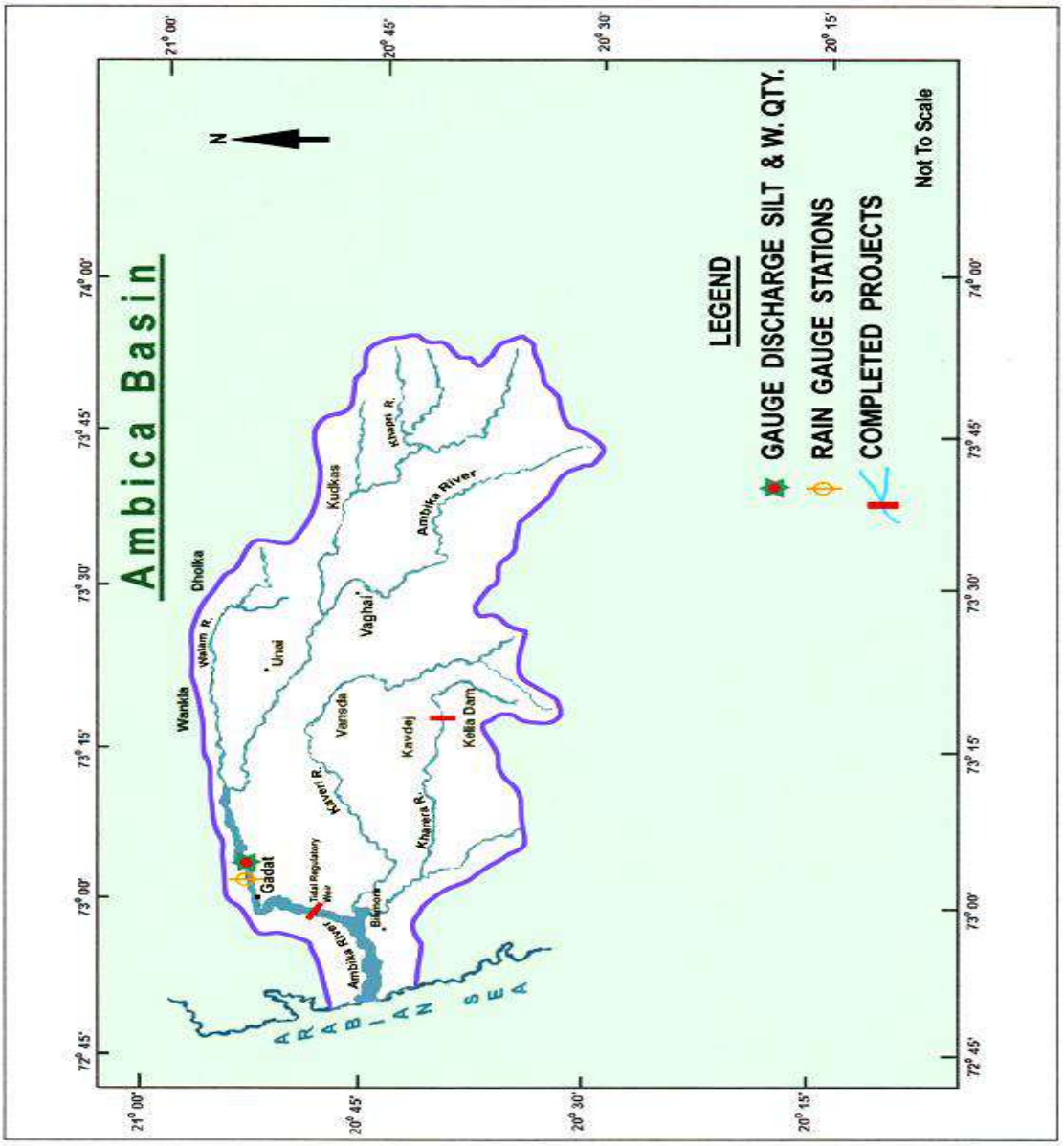
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

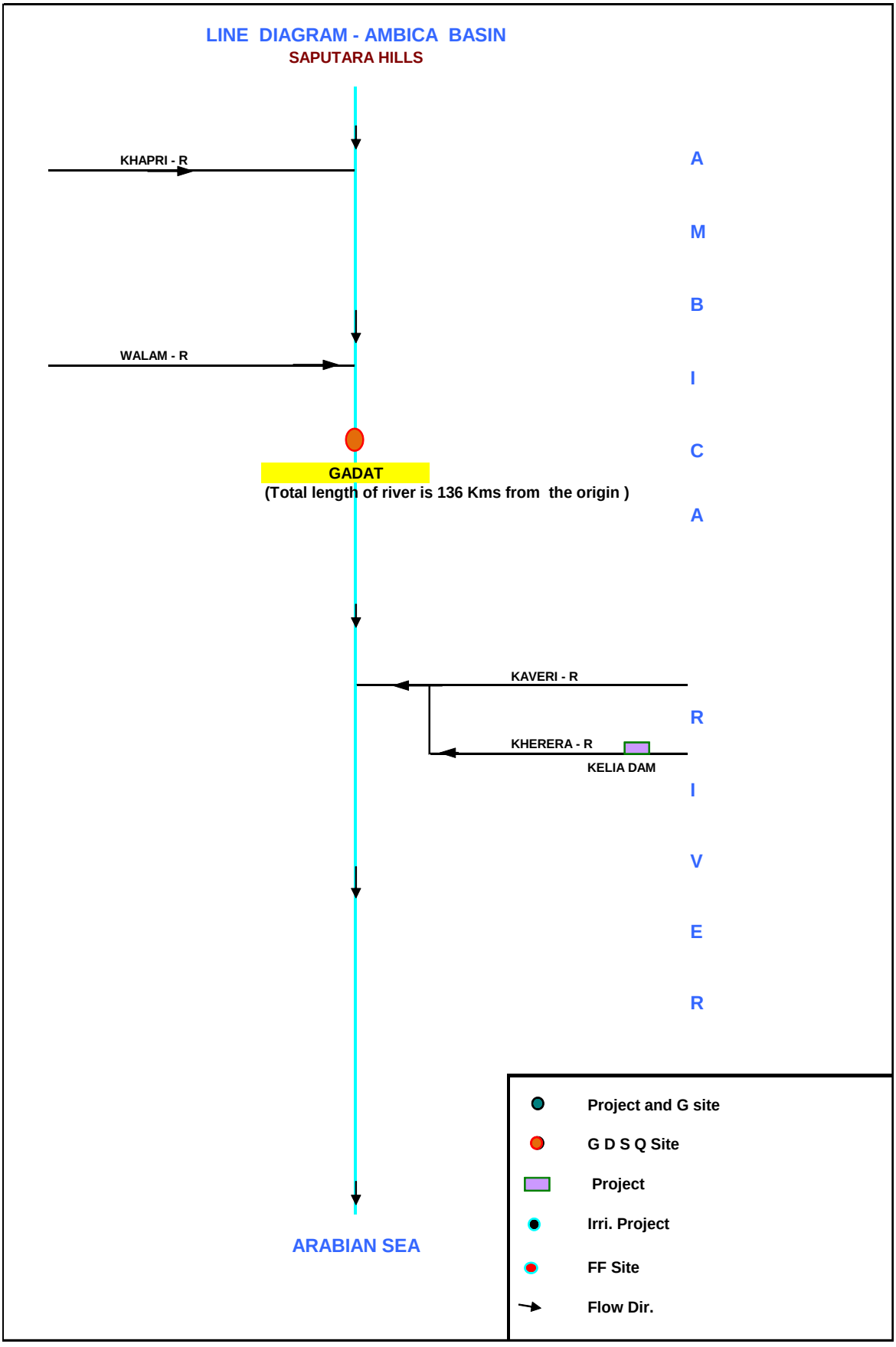
9. AMBIKA BASIN

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	**:**	**2016-2017**
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 : 2016-2017

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

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

S.No	Parameters	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	302.4	49.89	51.45	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		Clear		Clear		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	470		286		377		488		537		484	
4	EC_GEN (µmho/cm)	odour free		odourfree		odour free		odour free		odour free		odour free	
5	Odour_Code (-)	7.0		7.0				7.0		6.0		7.0	
6	pH_FLD (pH units)	8.1		7.4		8.2		8.2		8.2		8.3	
7	pH_GEN (pH units)	170		85		120		156		160		165	
8	SS (mg/L)	306		188		245		313		347		315	
9	TDS (mg/L)	32.0		27.0		25.0		22.0		19.0		28.0	
10	Temp (deg C)	476		273		365		469		507		475	
11	TS (mg/L)	1.0		8.0		5.0		1.0		1.0		1.0	
12	Turb (NTU)		Once in		Once in		Once in		Once in		Once in		Once in Two
	CHEMICAL	0.0	Two	0.0	Two	0.0	Two	0.0	Two	0.0	Two	0.0	Months
1	Alk-Phen (mgCaCO3/L)	80	Months	120	Months	110	Months	148	Months	170	Months	140	
2	ALK-TOT (mgCaCO3/L)	34		36		42		30		36		36	
3	Ca (mg/L)	70.0		70.0		80.0		68.0		72.0		65.0	
4	Cl (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
5	CO3 (mg/L)	0.13		0.09		0.12				0.14		0.13	
6	F (mg/L)	98		146		134		181		207		171	
7	HCO3 (mg/L)	4.2		3.8		3.4		4.0		4.2		4.5	
8	K (mg/L)	3.7		10.9		8.5		19.4		23.1		14.6	
9	Mg (mg/L)	48.0		50.0		48.0		46.0		46.0		50.0	
10	Na (mg/L)	0.13		0.12		0.20		0.12		0.11		0.19	
11	NH3-N (mg N/L)	0.20		0.20		0.17		0.24		0.21		0.19	
12	NO2+NO3 (mg N/L)	0.08		0.06		0.06		0.10		0.08		0.06	
13	NO2-N (mgN/L)	0.12		0.14		0.11		0.14		0.13		0.13	
14	NO3-N (mgN/L)	0.140		0.100		0.100		0.140		0.110		0.120	
15	P-Tot (mgP/L)	8.0		10.0		14.0		8.0		10.0		12.0	
16	SiO2 (mg/L)	12.0		6.0		6.0		10.0		12.0		8.0	
17	SO4 (mg/L)												
	BIOLOGICAL/BACTERIOLOGICAL	1.6		2.9		1.2		0.6		1.4		2.8	
1	BOD3-27 (mg/L)	96.0		26.0		24.0		5.0		40.0		40.0	
2	COD (mg/L)	7.3		7.8		7.0		7.7		7.8		7.9	
3	DO (mg/L)	100		98		85		87		85		101	
4	DO_SAT% (%)	600		700		600		800		300		1000	
5	FCol-MPN (MPN/100mL)	1500		1800		1600		1400		700		1800	
6	Tcol-MPN (MPN/100mL)												
	TRACE & TOXIC	0.08		0.08		0.12		0.06		0.08		0.12	
1	Al (mg/L)												
	CHEMICAL INDICES	85		90		105		75		90		90	
1	HAR_Ca (mgCaCO3/L)	100		136		140		156		186		151	
2	HAR_Total (mgCaCO3/L)	50		44		42		38		34		41	
3	Na% (%)	0.0		0.0		0.0		0.0		0.0		0.0	
4	RSC (-)	2.1		1.9		1.8		1.6		1.5		1.8	
5	SAR (-)	2.1		1.9		1.8		1.6		1.5		1.8	
	PESTICIDES												

Water Quality Summary for the period 2016-2017

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)	366	1559	0.000	49.05
2	EC_GEN (µmho/cm)	6	537	286	440
3	pH_FLD (pH units)	5	7.0	6.0	6.8
4	pH_GEN (pH units)	6	8.3	7.4	8
5	SS (mg/L)	6	170	85	143
6	TDS (mg/L)	6	347	188	286
7	Temp (deg C)	6	32.0	19.0	25.5
8	TS (mg/L)	6	507	273	428
9	Turb (NTU)	6	8.0	1.0	2.8
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	170	80	128
3	Ca (mg/L)	6	42	30	36
4	Cl (mg/L)	6	80.0	65.0	70.8
5	CO3 (mg/L)	6	0.0	0.0	0
6	F (mg/L)	5	0.14	0.09	0.12
7	HCO3 (mg/L)	6	207	98	156
8	K (mg/L)	6	4.5	3.4	4
9	Mg (mg/L)	6	23.1	3.7	13.4
10	Na (mg/L)	6	50.0	46.0	48
11	NH3-N (mg N/L)	6	0.20	0.11	0.14
12	NO2+NO3 (mg N/L)	6	0.24	0.17	0.2
13	NO2-N (mgN/L)	6	0.10	0.06	0.07
14	NO3-N (mgN/L)	6	0.14	0.11	0.13
15	P-Tot (mgP/L)	6	0.140	0.100	0.118
16	SiO2 (mg/L)	6	14.0	8.0	10.3
17	SO4 (mg/L)	6	12.0	6.0	9
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	2.9	0.6	1.7
2	COD (mg/L)	6	96.0	5.0	38.5
3	DO (mg/L)	6	7.9	7.0	7.6
4	DO_SAT% (%)	6	101	85	93
5	FCol-MPN (MPN/100mL)	6	1000	300	667
6	Tcol-MPN (MPN/100mL)	6	1800	700	1467
	TRACE & TOXIC				
1	Al (mg/L)	6	0.12	0.06	0.09
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	105	75	89
2	HAR_Total (mgCaCO3/L)	6	186	100	145
3	Na% (%)	6	50	34	42
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.1	1.5	1.8
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2017

Station Name : Ambika at Gadat (01 02 20 001)
Local River: Ambika

Division: Tapi Division, Surat
Sub-Division: LTSD, Surat

S.No	Parameters	Flood												Winter												Summer											
		Jun - Oct												Nov - Feb												Mar - May											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	609.4	117.8	476.1	82.01	43.36	142.0	184.7	87.89	136.2	253.6	25.22	80.75	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	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)			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	378	405	483	556	495	417	355			502	305	446	513	423	530	486	442	410		541		510	486	454	484
4	pH_FLD (pH units)			8.0	7.8	7.8	7.9	7.7			7.0	7.0	7.0			8.0	7.9	7.9	7.9				7.0	6.9	6.5			7.8	7.8	7.0				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	8.3	8.2	7.9	8.2	8.3	7.9	7.3	7.7	8.2			8.1	8.1	8.0	8.2	8.4	8.8	8.4	8.4	7.9		6.5		8.3	8.1	8.2	8.3
6	SS (mg/L)	64	91	138	120	155	120	123	110	112	102	107	125	90	119	192	165	169	122			160	128	135	158	78	104	166	183	139		180		160	140	145	165
7	TDS (mg/L)	191	198	271	256	261	240	215	220	242	214	252	246	285	333	326	306	273	244			326	206	291	330	276	403	317	310	272		350		300	300	293	315
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	28.0	20.5	22.5	22.0	23.5	24.0	26.0			22.5	23.5	22.0	20.5	24.0	27.0	27.0	23.0	24.0		25.0		28.0	27.0	29.0	28.0
9	TS (mg/L)						360	359	330	302	301	589	371						366			486	334	427	488							530		485	454	438	475
10	Turb (NTU)						2.3	7.0	11.5	1.3	4.0	4.0	4.7						1.0			2.5	2.0	2.0	1.0							3.0		2.0	2.0	2.0	1.0
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	2.0	3.3	3.3	1.7	1.7	5.5	0.0	0.0	0.0	6.9	0.0	0.0	0.0	2.5	2.5	0.0	0.0	0.0			0.0	2.5	0.0	0.0	5.0	5.0	5.0	5.0	0.0		0.0		5.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	147	193	213	177	210	104	82	105	65	117	104	103	320	185	175	190	90	80			98	105	95	159	470	210	190	310	120		90		113	193	105	140
3	Ca (mg/L)	32	32	32	32	33	32	32	32	29	35	31	37	32	34	32	32	32	36			31	35	36	33	34	32	32	32	34		36		38	43	38	36
4	Cl (mg/L)	24.2	12.9	55.9	29.8	187.9	85.5	84.1	49.8	83.3	67.7	63.3	73.3	25.8	19.5	38.5	44.9	76.6	145.9			95.0	62.5	71.5	70.0	31.3	13.5	23.1	189.4	127.7		222.0		72.0	62.0	60.0	65.0
5	CO3 (mg/L)	1.3	4.0	4.0	2.0	2.0	6.7	0.0	0.0	0.0	8.3	0.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0			0.0	3.0	0.0	0.0	6.0	6.0	6.0	6.0	0.0		0.0		6.0	0.0	0.0	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	0.11	0.05	0.05	0.07	0.16	0.18	0.18			0.16	0.21	0.13	0.14	0.05	0.05	0.07	0.32	0.24		0.16		0.24	0.14	0.13	0.13
7	HCO3 (mg/L)	179	114	126	106	126	114	101	128	80	125	127	126	262	110	104	116	110	98			119	122	116	194	280	122	110	183	146		110		126	235	128	171
8	K (mg/L)		0.4	12.1	0.3	7.2	13.3	9.6	2.4	3.2	3.6	3.8	3.8		0.7	2.9	1.9	2.0	4.2			4.4	3.8	4.7	4.1		4.4	0.3	26.2	11.4		10.2		4.4	4.2	3.4	4.5
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	7.7	8.3	9.2	6.8	8.8	8.7	8.3			8.1	8.8	8.5	21.3	9.7	8.7	5.8	7.8	9.7		8.6		8.8	15.5	6.1	14.6
10	Na (mg/L)		7.8	33.4	17.3	125.3	49.3	45.7	37.1	47.1	50.5	45.3	48.7		11.5	22.9	29.3	44.4	77.4			64.5	40.4	42.0	46.0		7.8	14.9	138.6	84.6		130.0		54.0	46.0	42.0	50.0
11	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	0.15	0.05	0.06	0.08	0.07	0.05	0.06			0.13	0.12	0.14	0.11	0.05	0.05	0.07	0.16	0.05		0.12		0.16	0.13	0.12	0.19
12	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	0.19	0.01	0.01	0.05	0.06	0.03	0.16			0.26	0.24	0.18	0.23	0.01	0.01	0.04	0.04	0.06		0.11			0.22	0.25	0.19
13	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	0.07	0.00	0.00	0.00	0.00	0.00	0.06			0.12	0.07	0.07	0.09	0.00	0.00	0.00	0.00	0.00		0.01			0.06	0.12	0.06
14	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	0.12	0.01	0.01	0.05	0.06	0.03	0.10			0.15	0.17	0.11	0.13	0.01	0.01	0.04	0.04	0.06		0.10		0.12	0.16	0.13	0.13
15	o-PO4-P (mg P/L)						0.073	0.080	0.065										0.060													0.100					
16	P-Tot (mgP/L)	0.304	0.107	0.127	0.265	0.200	0.120	0.360	0.140	0.173	0.160	0.130	0.113	0.111	0.060	0.182	0.170	0.060	0.140			0.180	0.150	0.155	0.125	0.080	0.060	0.062	0.280	0.240		0.240		0.200	0.160	0.140	0.120
17	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	10.7	14.8	14.8	21.6	17.8	14.5	20.6			8.4	7.7	8.0	9.0	15.1	15.1	24.3	17.7	12.7		8.0		8.2	8.0	8.0	12.0
18	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	8.0	16.6	16.3	6.3	16.6	12.2	4.8			11.3	12.3	9.0	11.0	13.8	3.0	1.0	13.3	14.4		12.0		18.0	4.0	8.0	8.0
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	1.9	0.4	0.7	0.5	0.7	0.5	0.5			1.8	1.4	1.8	1.0	0.6	1.4	0.7	0.6	2.5		0.7		3.4	4.7	2.7	2.8
2	COD (mg/L)											78.0	48.7										12.0	50.0	22.5									64.0	4.0	40.0
3	DO (mg/L)									7.8	8.1	7.8	7.4					6.8					8.2	7.8	7.7					10.4				7.8	7.8	7.9
4	DO_SAT% (%)									98	107	103	95					81					96	90	86					124				98	101	101
5	FCol-MPN (MPN/100mL)										2100	467	633									6500	750	1250	550								8000	500	1000	1000
6	Tcol-MPN (MPN/100mL)										4600	867	1633									14000	1400	2300	1050								16000	800	2000	1800
	TRACE & TOXIC																																				
1	Al (mg/L)						0.15	0.06	0.09	0.11	0.08	0.09	0.09						0.06			0.11	0.10	0.08	0.07							0.10		0.06	0.08	0.05	0.12
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	80	79	80	80	81	80	80	80	73	87	77	93	80	84	80	80	80	90			78	88	90	83	84	80	80	80	84		90		95	108	95	90
2	HAR_Total (mgCaCO3/L)	115	110	113	110	118	114	110	113	102	124	114	126	115	123	108	117	116	125			111	124	126	171	125	116	104	113	125		126		132	172	121	151
3	Na% (%)		13	36	25	54	40	45	41	47	46	46	45		15	28	35	45	57			55	41	41	36		12	24	67	57		67		46	36	42	41
4	RSC (-)	1.0	0.0	0.1	0.0	0.0	0.1	0.0	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	0.0	2.3	0.0	0.0	1.0	0.0		0.0		0.0	0.4	0.0	0.0
5	SAR (-)		0.3	1.4	0.7	5.0	2.0	1.9	1.5	2.0	2.0	1.9	1.9		0.5	1.0	1.2	1.8	3.0			2.7	1.6	1.6	1.5		0.3	0.6	5.7	3.3		5.1		2.1	1.5	1.7	1.8
	PESTICIDES																																				

ONCE IN 2 MONTHS / POOLING CONDITION

Pesticides, Trace and Toxic element analysis

Station Name: Ambika at Gadat (01 02 20 001)
Local River: Ambika

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	01.12.16	01.04.17	01.04.17
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	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
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	0.00121	0.2638	0.001
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	0.00006	0.3	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	0.00286	0	0.003
4	Cu	Copper	microgram / l	-	-	-	-	-		7.87		-	2.89	12.82			20.47	-		1.620	0.041	-	0.00063	0.00208		0.00244	4.7	0.014
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	0.00233	0.6	0.003
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	0.00032	0	0.002
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	0.0111	18.46	0.046
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

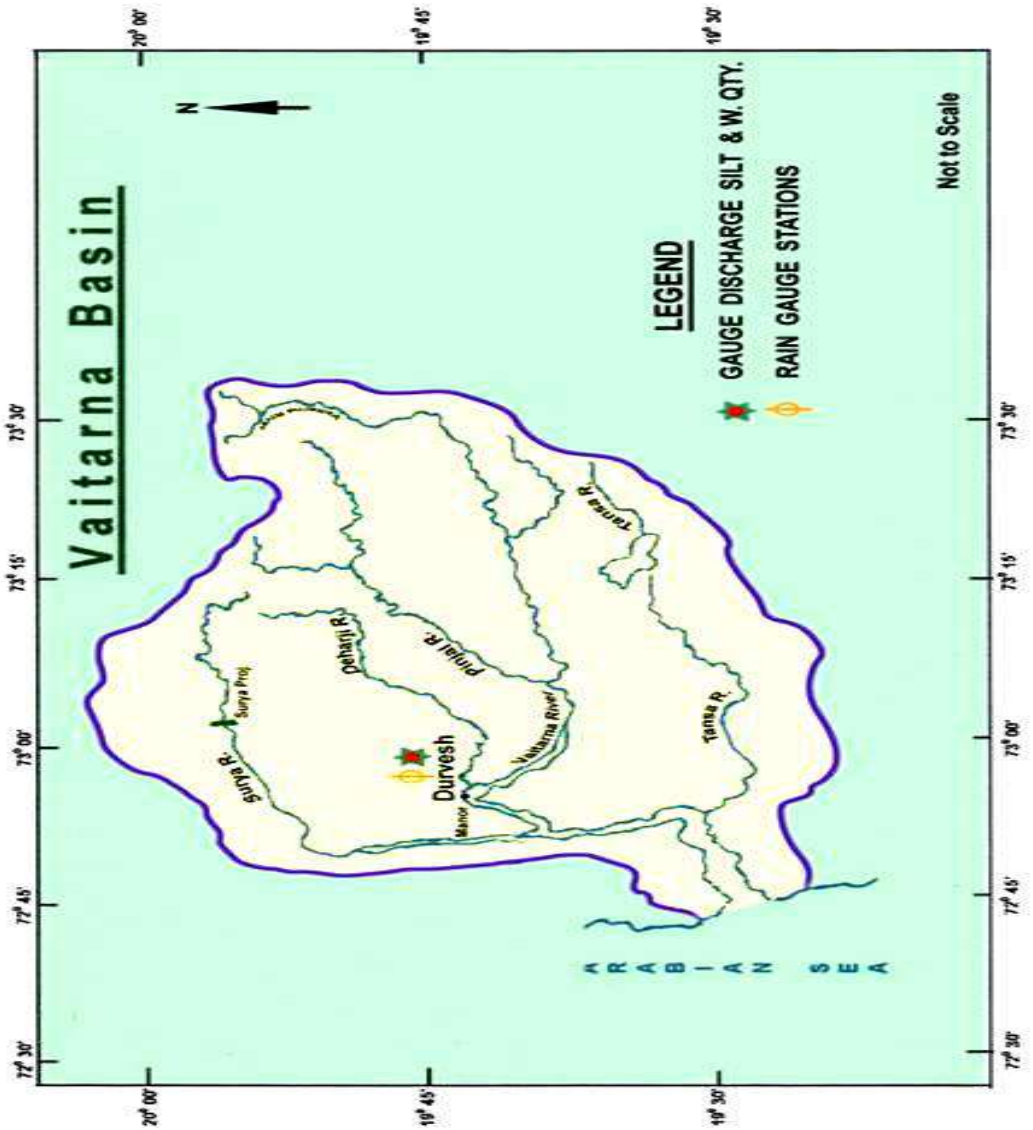
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

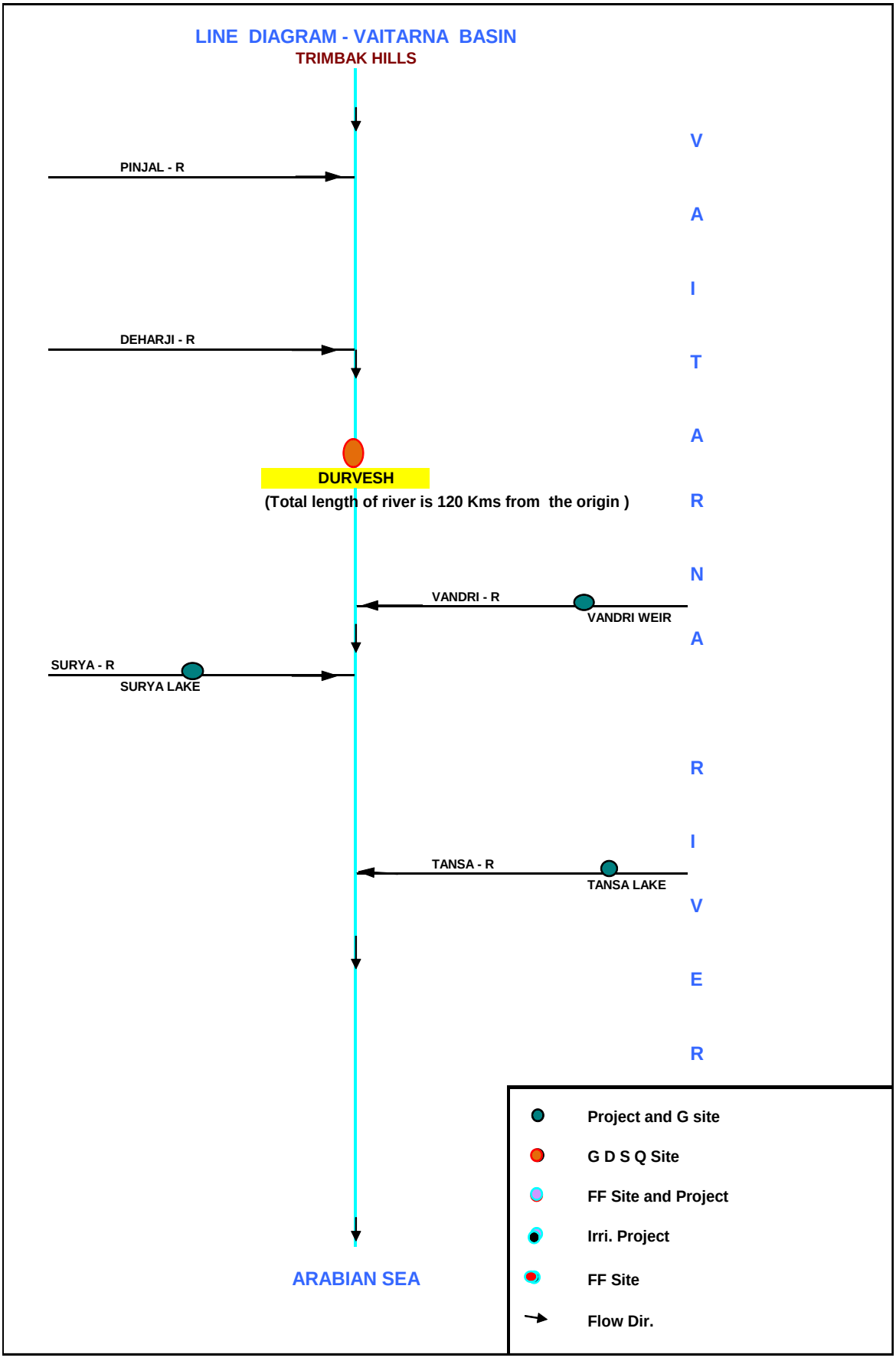
10. VAITARNA BASIN

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	**:**	**2016-2017**
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 : 2016-2017

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

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

S.No	Parameters	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	765.6	47.08	25.70	0.600	0.000	0.000	0.000	0.000	0.000	0.000
2	Colour_Cod (-)	Clear		Brown		L Brown		Clear		Clear		Clear	
3	EC_FLD (µmho/cm)	337		220		230		250		560		380	
4	EC_GEN (µmho/cm)	odour free		odour free		odour free		odour free		odour free		odour free	
5	Odour_Code (-)	6.0		8.8		7.9		8.0		6.8			
6	pH_FLD (pH units)	7.9		7.8		8.0		8.2		8.2		8.2	
7	pH_GEN (pH units)	110		70		80		90		150		135	
8	SS (mg/L)	250		144		150		170		360		247	
9	TDS (mg/L)	23.0		17.0		19.0		16.0		14.0		24.0	
10	Temp (deg C)	360		214		230		269		710		387	
11	TS (mg/L)	1.0		2.0		1.0		1.0		1.0		1.0	
12	Turb (NTU)												
	CHEMICAL	0.0		0.0		0.0		0.0		0.0		0.0	
1	Alk-Phen (mgCaCO3/L)	95		130		63		98		120		90	
2	ALK-TOT (mgCaCO3/L)	38		28		21		24		28		32	
3	Ca (mg/L)	80.0		80.0		70.0		72.0		70.0		80.0	
4	Cl (mg/L)	0.0		0.0		0.0		0.0		0.0		0.0	
5	CO3 (mg/L)	0.14		0.10		0.13		0.15		0.14		0.14	
6	F (mg/L)	116		159		77		120		146		110	
7	HCO3 (mg/L)	3.6		3.4		3.2		3.6		4.8		4.0	
8	K (mg/L)	6.1	Once in Two Months	17.0	Once in Two Months	6.8	Once in Two Months	9.7	Once in Two Months	14.6	Once in Two Months	12.2	Once in Two Months
9	Mg (mg/L)	52.0		56.0		40.0		52.0		54.2		47.0	
10	Na (mg/L)	0.09		0.08		0.20		0.14		0.10		0.11	
11	NH3-N (mg N/L)	0.19		0.17		0.24		0.26		0.22		0.20	
12	NO2+NO3 (mg N/L)	0.06		0.08		0.11		0.10		0.06		0.08	
13	NO2-N (mgN/L)	0.13		0.09		0.13		0.16		0.16		0.12	
14	NO3-N (mgN/L)	0.130		0.110		0.140		0.110		0.150		0.090	
15	P-Tot (mgP/L)	6.8		13.0		8.0		6.0		10.0		12.0	
16	SiO2 (mg/L)	14.0		7.0		6.0		16.0		14.0		18.0	
17	SO4 (mg/L)												
	BIOLOGICAL/BACTERIOLOGICAL	1.7		1.6		1.6		0.8		1.4		1.2	
1	BOD3-27 (mg/L)	120.0		24.0		16.0		36.0		16.0		28.0	
2	COD (mg/L)			8.1		6.1		7.7		7.1		5.9	
3	DO (mg/L)			84		66		78		69		70	
4	DO_SAT% (%)	1200		800		500		900		700		1500	
5	FCol-MPN (MPN/100mL)	2000		2000		1100		2200		1200		3100	
6	Tcol-MPN (MPN/100mL)												
	TRACE & TOXIC	0.09		0.07		0.06		0.05		0.11		0.11	
1	Al (mg/L)												
	CHEMICAL INDICES	95		70		52		60		70		80	
1	HAR_Ca (mgCaCO3/L)	120		141		80		101		131		131	
2	HAR_Total (mgCaCO3/L)	48		46		51		52		46		43	
3	Na% (%)	0.0		0.0		0.0		0.0		0.0		0.0	
4	RSC (-)	2.1		2.1		1.9		2.3		2.1		1.8	
5	SAR (-)	2.1		2.1		1.9		2.3		2.1		1.8	
	PESTICIDES												

Water Quality Summary for the period 2016-2017

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	3850	0.000	59.19
2	EC_GEN (µmho/cm)	6	560	220	330
3	pH_FLD (pH units)	5	8.8	6.0	7.5
4	pH_GEN (pH units)	6	8.2	7.8	8
5	SS (mg/L)	6	150	70	106
6	TDS (mg/L)	6	360	144	220
7	Temp (deg C)	6	24.0	14.0	18.8
8	TS (mg/L)	6	710	214	362
9	Turb (NTU)	6	2.0	1.0	1.2
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	6	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	6	130	63	99
3	Ca (mg/L)	6	38	21	29
4	Cl (mg/L)	6	80.0	70.0	75.3
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	159	77	121
8	K (mg/L)	6	4.8	3.2	3.8
9	Mg (mg/L)	6	17.0	6.1	11.1
10	Na (mg/L)	6	56.0	40.0	50.2
11	NH3-N (mg N/L)	6	0.20	0.08	0.12
12	NO2+NO3 (mg N/L)	6	0.26	0.17	0.21
13	NO2-N (mgN/L)	6	0.11	0.06	0.08
14	NO3-N (mgN/L)	6	0.16	0.09	0.13
15	P-Tot (mgP/L)	6	0.150	0.090	0.122
16	SiO2 (mg/L)	6	13.0	6.0	9.3
17	SO4 (mg/L)	6	18.0	6.0	12.5
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	6	1.7	0.8	1.4
2	COD (mg/L)	6	120.0	16.0	40
3	DO (mg/L)	5	8.1	5.9	7
4	DO_SAT% (%)	5	84	66	73
5	FCol-MPN (MPN/100mL)	6	1500	500	933
6	Tcol-MPN (MPN/100mL)	6	3100	1100	1933
	TRACE & TOXIC				
1	Al (mg/L)	6	0.11	0.05	0.08
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	6	95	52	71
2	HAR_Total (mgCaCO3/L)	6	141	80	117
3	Na% (%)	6	52	43	48
4	RSC (-)	6	0.0	0.0	0
5	SAR (-)	6	2.3	1.8	2
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2017

Station Name : Vaitarna at Durvesh (01 02 25 001)

Division: Tapi Division, Surat

Local River: Vaitarna

Sub-Division: DGSD, Silvassa

S.No	Parameters	Flood												Winter												Summer									
		Jun - Oct												Nov - Feb												Mar - May									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	480.6	401.8	468.3	401.9	73.39	542.6	460.6	256.0	279.0	752.9	58.56	167.7	7.050	6.022	7.717	12.08	15.27	34.19	10.43	1.751	22.22	0.471	0.436	0.150	0.000	0.000	1.426	3.141	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	413	277	262	1511	288	763	5166	4433			290	809	380	515	405	10000	2396	7269	10000	1976			290	900	570	560	380
4	pH_FLD (pH units)			8.0	8.0	8.1	7.3				8.5	8.1	7.6		7.4	7.5	7.6	8.1				8.4	8.7	6.3	7.4					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	7.9	7.7	8.2	8.5	8.0	7.9			7.8	8.0	8.3	8.1	8.2	8.0	8.4	8.4	7.6	7.9			7.8	8.4	8.2	8.2	8.2
6	SS (mg/L)	52	49	94	79	112	100	98	85	85	105	93	87	121	83	168	748	1260			82	270	115	185	120	989	292	622	1607	572			100	280	250	200	135
7	TDS (mg/L)	117	70	124	121	185	201	230	177	141	267	179	181	1196	194	458	3570	2502			190	534	247	335	265	8954	2107	4750	6970	1153			230	589	370	360	247
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	19.7	24.0	25.0	24.0	24.0	24.5			13.0	18.5	16.5	17.0	15.0	27.0	27.0	28.0	25.0	26.0			22.0	20.0	20.0	21.0	24.0
9	TS (mg/L)						301	295	262	297	329	185	268								272	804	347	3320	490								330	869	755	1755	387
10	Turb (NTU)						2.5	11.0	5.0	3.0	1.7	6.0	1.3								1.0	2.0	2.0	1.5	1.0								1.0	1.0	4.0	3.0	1.0
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	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	0.0	5.0	0.0	0.0			0.0	0.0	7.9	0.0	0.0	0.0	5.0	5.0	0.0	0.0			0.0	5.0	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	85	170	200	170	185	117	78	95	91	94	113	96	130	200	170	260	100			80	104	93	110	109	240	290	170	800	130			90	95	168	95	90
3	Ca (mg/L)	31	31	31	30	32	31	31	31	34	34	31	29	31	32	32	39	33			28	34	29	38	26	39	32	35	40	36			30	40	40	34	32
4	Cl (mg/L)	6.9	5.1	63.0	13.8	34.6	59.8	110.3	34.3	91.5	74.3	67.3	76.7	406.5	1.0	73.7	1194.2	4655.7			75.2	83.0	75.0	78.0	71.0	5013.1	59.1	117.7	4731.2	355.2			78.0	146.0	80.0	70.0	80.0
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	0.0	6.0	0.0	0.0			0.0	0.0	9.5	0.0	0.0	0.0	6.0	6.0	0.0	0.0			0.0	6.0	0.0	0.0	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	0.12	0.22	0.05	0.05	0.36	0.09			0.30	0.20	0.25	0.16	0.15	0.05	0.09	0.05	0.44	0.28			0.16	0.20	0.15	0.13	0.14
7	HCO3 (mg/L)	104	104	122	104	110	143	95	116	106	112	138	117	159	122	98	159	122			98	127	95	134	133	146	171	98	488	159			110	104	205	116	110
8	K (mg/L)		0.1	14.9	0.1	3.1	17.6	9.9	2.1	3.1	3.5	3.3	3.4		1.1	5.5	30.6	83.5			2.4	5.2	4.0	4.0	4.2		11.1	12.1	440.0	12.4			2.6	5.8	4.8	3.0	4.0
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	10.0	5.8	7.8	8.7	12.6	9.2			6.6	8.8	11.5	9.7	12.2	12.6	7.9	11.7	11.7	12.6			6.0	9.7	13.6	6.1	12.1
10	Na (mg/L)		3.1	36.5	7.7	25.7	44.0	60.8	23.0	55.1	49.8	46.7	49.3		1.0	39.5	776.0	2990.4			53.8	54.0	46.4	46.0	53.1		34.3	76.5	3078.0	232.2			53.8	86.0	52.4	52.0	47.0
11	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	0.12	0.20	0.05	0.05	0.26	0.10			0.12	0.17	0.16	0.12	0.12	0.18	0.08	0.13	0.08	0.08			0.12	0.20	0.12	0.08	0.11
12	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	0.20	0.08	0.00	0.01	0.17	0.03			0.16	0.20	0.21	0.17	0.24	0.01	0.03	0.07	0.13	0.07			0.20		0.19	0.20	0.20
13	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	0.08	0.00	0.00	0.00	0.00	0.00			0.05	0.06	0.07	0.05	0.08	0.00	0.00	0.00	0.00	0.00			0.08		0.06	0.08	0.08
14	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	0.12	0.08	0.00	0.01	0.17	0.03			0.11	0.13	0.14	0.12	0.16	0.01	0.03	0.07	0.13	0.07			0.12	0.16	0.13	0.12	0.12
15	o-PO4-P (mg P/L)						0.070	0.080	0.055												0.160															
16	P-Tot (mgP/L)	0.255	0.075	0.060	0.404	0.130	0.060	0.405	0.210	0.220	0.153	0.130	0.127	0.180	0.050	0.097	0.380	0.120			0.380	0.210	0.210	0.130	0.130	0.028	0.080	0.060	0.320	0.200			0.250	0.220	0.180	0.140	0.090
17	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	9.3	14.8	15.3	22.4	26.8	14.9			10.0	9.2	8.5	10.0	8.0	22.2	20.8	28.8	28.5	13.5			12.0	8.0	9.6	8.0	12.0
18	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	9.0	37.5	8.4	5.6	28.8	46.0			10.6	15.8	15.2	8.5	15.0	144.1	25.6	55.9	284.9	18.3			10.2	16.0	4.0	15.0	18.0
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	1.6	2.0	1.3	0.4	9.0	1.1			1.4	1.8	2.4	2.8	1.1	4.0	5.0	8.0	5.0	8.0			2.0	3.3	4.5	2.5	1.2
2	COD (mg/L)											46.0	53.3										36.0	12.0	26.0									64.0	16.0	28.0
3	DO (mg/L)			5.6	5.8	5.8	9.0			6.6	5.9	7.1	7.1		6.3	5.9	5.8	7.1				9.3	6.2	6.3	7.4					5.5				11.2	5.5	6.9	5.9
4	DO_SAT% (%)			73	75	74	119			81	67	78	75		76	70	69	88				98	63	66	73					68				123	60	78	70
5	FCol-MPN (MPN/100mL)										1133	433	833									1000	1000	1150	800								3000	400	900	1500
6	Tcol-MPN (MPN/100mL)										2400	833	1700									3000	1700	2300	1700								7000	800	2000	3100
	TRACE & TOXIC																																				
1	Al (mg/L)						0.10	0.08	0.14	0.14	0.15	0.09	0.07								0.14	0.10	0.10	0.09	0.08								0.10	0.08	0.06	0.08	0.11
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	76	76	78	76	80	78	78	78	85	85	78	72	76	80	80	97	82			70	85	72	95	65	97	80	88	100	89			75	100	100	85	80
2	HAR_Total (mgCaCO3/L)	103	100	109	102	109	117	104	106	115	112	122	114	100	113	116	150	121			98	121	120	136	116	150	113	137	149	142			100	141	157	111	131
3	Na% (%)		6	38	14	32	30	52	31	50	48	45	48		2	41	90	64			54	47	45	42	49		37	52	90	76			53	56	41	50	43
4	RSC (-)	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	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	0.2	0.0	0.0
5	SAR (-)		0.1	1.5	0.3	1.1	1.7	2.6	1.0	2.2	2.1	1.9	2.0		0.0	1.6	27.7	110.0			2.4	2.1	1.8	1.7	2.2		1.4	2.9	110.1	8.5			2.3	3.2	1.8	2.2	1.8
	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: Vaitarna at Durvesh (01 02 25 001)
Local River: Vaitarna

Division: Tapi Division, surat
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	01.12.16	01.04.17	01.04.17
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 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 WQL-III Lab, UGD, Hyderabad	nalysis done by NRWQL, New Delhi	nalysis done by WQL-III Lab, UGD, Hyderabad	nalysis done by NRWQL, New Delhi
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	0.00007	0.4613	0.001
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	0.00008	28.7	0
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	0.00366	213.7	0.018
4	Cu	Copper	microgram / l	-	-	-	-	-		7.24			37.36	9.00			20.47	7.24		8.1	0.024	-	0.00038	0.0015		0.00615	32	0.034
5	Hg	Mercury	microgram / l	-	-	0	-	-		0.53			-	-			0.69	0.53		-	-	0.143			0		0.551	
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	0.01984	208.7	0.002
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	0.00691	140	0.228
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	0.0129	19.31	0.025
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

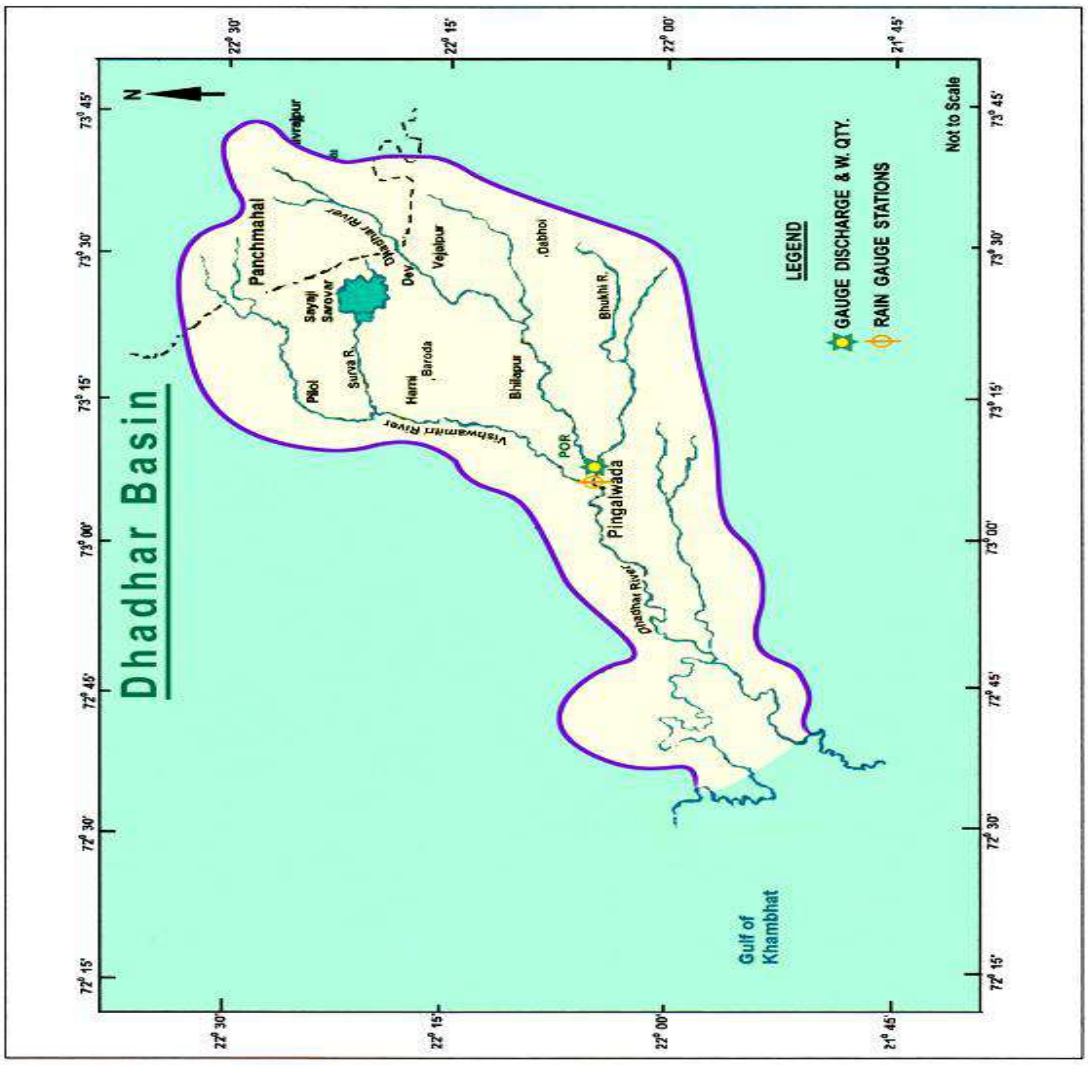
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

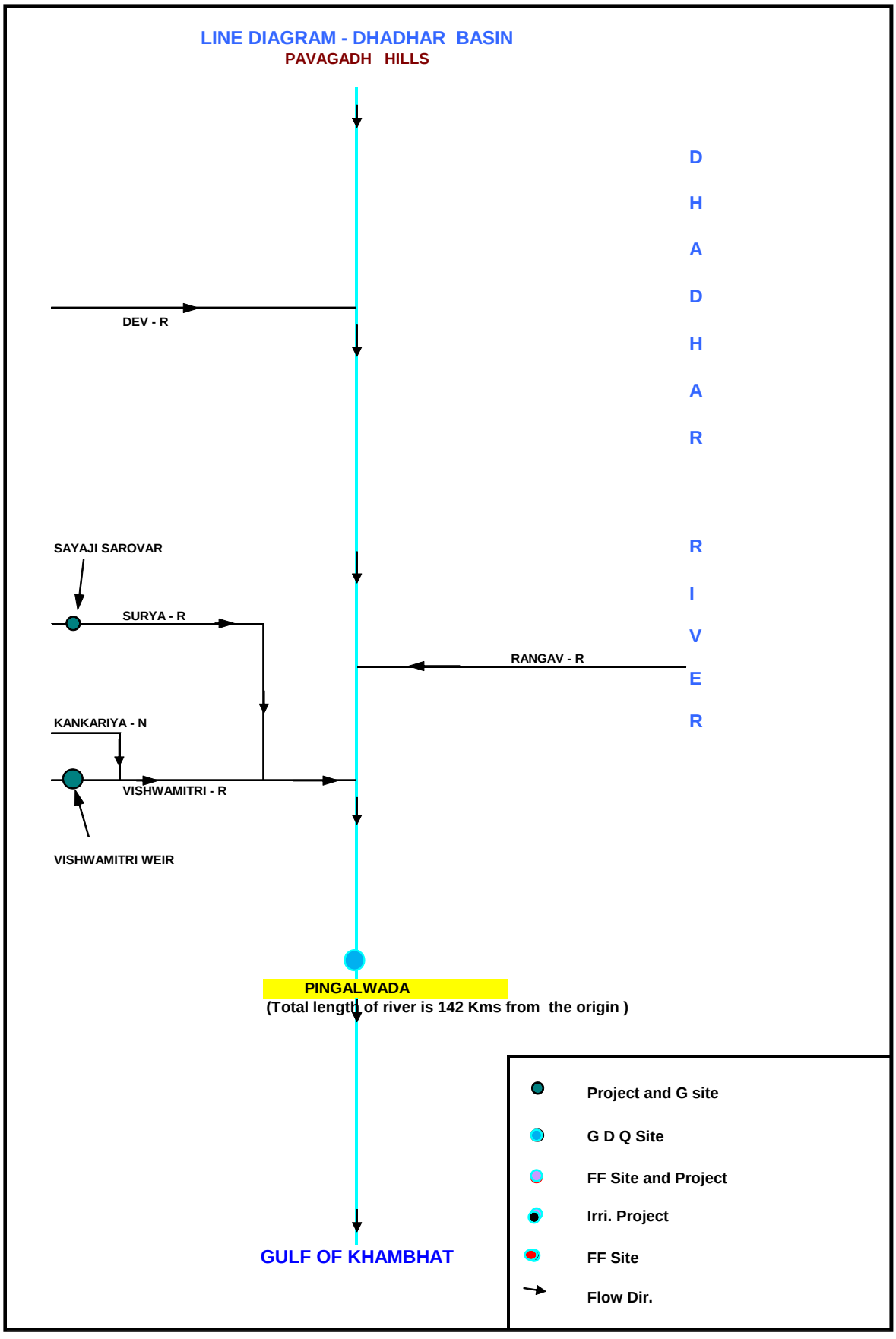
11. DHADAR BASIN

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	**:**	**2016-2017**
Site	**:**	**Dhadar 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 : 2016-2017													
Station Name: Dhadhar at Pingalwada (01 02 14 001)													Division: Tapi Division,
Local River: Dhadhar													Sub Division: LNSD, Bharuch
S.No	Parameters	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	0.000	0.000	0.000	20.67	10.97	9.047	5.979	7.150	10.45	5.800	4.200	7.350
2	Colour_Cod (-)	Light Green	Light Green	L brown	Light Brown	Light Brown	Clear	Light Brown	Light Brown	Light Green	Light Brown	Dark Brown	Dark Brown
3	EC_FLD (µmho/cm)	400	1300	400	800	1200			1200		1300	300	
4	EC_GEN (µmho/cm)	316	460	490	370	600	430	560	620	465	620	480	1056
5	Odour_Code (-)	septic	fishy	septic	fishy	fishy	fishy	fishy	fishy	fishy	fishy	fishy	septic
6	pH_FLD (pH units)	6.5	6.0	7.0	6.5	7.0	7.0	8.1	7.4	6.5	6.5	6.5	
7	pH_GEN (pH units)	7.8	7.3	6.6	7.6	7.4	7.6	7.9	7.4	7.2	6.6	8.2	7.1
8	SS (mg/L)	100	160	160	110	200	150	250	250	200	220	180	510
9	TDS (mg/L)	260	300	325	240	390	280	360	400	300	400	312	680
10	Temp (deg C)	26.0	27.0	22.0	24.0	24.0	18.0	23.0	10.0	16.0	18.0	24.0	24.0
11	TS (mg/L)	360	1307	485	602	1067	430	560	650	500	1279	472	1060
12	Turb (NTU)	2.0	5.0	2.0	15.0	1.0	4.0	1.0	1.0	2.0	3.0	14.0	3.0
	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)	90	123	105	119	140	120	114	150	95	130	150	180
3	Ca (mg/L)	40	36	30	36	51	36	30	36	31	31	44	50
4	Cl (mg/L)	90.0	60.0	60.0	68.0	60.0	75.0	82.0	75.0	90.0	85.0	70.0	235.0
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)	0.12	0.10	0.12	0.12	0.12	0.14	0.16	0.12	0.13	0.11	0.11	0.12
7	HCO3 (mg/L)	110	150	128	145	171	146	139	183	116	159	183	220
8	K (mg/L)	3.8	4.4	3.6	3.0	4.6	3.8	3.2	4.0	4.6	3.8	4.2	40.3
9	Mg (mg/L)	7.3	6.9	10.9	7.2	5.6	12.2	18.2	21.9	17.5	21.4	9.7	9.7
10	Na (mg/L)	48.0	46.0	42.0	50.0	45.0	46.0	50.0	46.0	48.0	50.0	52.0	165.0
11	NH3-N (mg N/L)	0.11	0.10	0.12	0.08	0.14	0.11	0.12	0.10	0.11	0.09	0.10	0.10
12	NO2+NO3 (mg N/L)	0.17	0.16	0.22	0.23	0.18	0.20	0.21	0.18	0.20	0.16	0.20	0.26
13	NO2-N (mgN/L)	0.05	0.06	0.06	0.10	0.06	0.08	0.05	0.08	0.06	0.06	0.10	0.08
14	NO3-N (mgN/L)	0.12	0.10	0.16	0.13	0.12	0.12	0.16	0.10	0.14	0.10	0.10	0.18
15	P-Tot (mgP/L)	0.130	0.100	0.160	0.140	0.120	0.100	0.160	0.120	0.120	0.130	0.130	0.130
16	SiO2 (mg/L)	8.0	9.0	14.0	14.0	10.0	10.0	10.0	10.0	8.0	12.0	7.0	1.0
17	SO4 (mg/L)	10.0	8.0	10.0	10.0	16.0	10.0	8.0	20.0	16.0	10.0	7.0	19.0
	BIOLOGICAL/BACTERIOLOGICAL												
1	BOD3-27 (mg/L)	1.4	2.0	2.2	2.8	3.5	8.0	6.7	9.8	4.0	33.0	35.0	9.0
2	COD (mg/L)	80.0	20.0	16.0	28.0	28.0	104.0	36.0	56.0	60.0	104.0	36.0	56.0
3	DO (mg/L)	2.0	0.0	0.5	8.5			7.5	2.9	5.7	4.5	2.4	2.6
4	DO_SAT% (%)	25	0	6	101			87	26	58	48	28	30
5	FCol-MPN (MPN/100mL)	1800	4000	400	3000	2800	1200	1100	1800	1100	1000	2200	700
6	Tcol-MPN (MPN/100mL)	4000	8500	800	5000	6000	2600	2400	4000	2200	1800	4100	1800
	TRACE & TOXIC												
1	Al (mg/L)	0.10	0.06	0.11	0.11	0.10	0.09	0.12	0.12	0.12	0.08	0.10	0.10
	CHEMICAL INDICES												
1	HAR_Ca (mgCaCO3/L)	100	90	75	90	127	90	75	90	78	77	110	125
2	HAR_Total (mgCaCO3/L)	130	119	121	121	151	141	151	181	151	166	151	166
3	Na% (%)	44	45	42	47	39	41	41	35	40	39	42	62
4	RSC (-)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
5	SAR (-)	1.8	1.8	1.7	2.0	1.6	1.7	1.8	1.5	1.7	1.7	1.8	5.6
	PESTICIDES												

Water Quality Summary for the period 2016-2017

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)	364	124.3	0.000	9.315
2	EC_FLD (µmho/cm)	8	1300	300	863
3	EC_GEN (µmho/cm)	12	1056	316	539
4	pH_FLD (pH units)	11	8.1	6.0	6.8
5	pH_GEN (pH units)	12	8.2	6.6	7.4
6	SS (mg/L)	12	510	100	208
7	TDS (mg/L)	12	680	240	354
8	Temp (deg C)	12	27.0	10.0	21.3
9	TS (mg/L)	12	1307	360	731
10	Turb (NTU)	12	15.0	1.0	4.4
	CHEMICAL				
1	Alk-Phen (mgCaCO3/L)	12	0.0	0.0	0
2	ALK-TOT (mgCaCO3/L)	12	180	90	126
3	Ca (mg/L)	12	51	30	38
4	Cl (mg/L)	12	235.0	60.0	87.5
5	CO3 (mg/L)	12	0.0	0.0	0
6	F (mg/L)	12	0.16	0.10	0.12
7	HCO3 (mg/L)	12	220	110	154
8	K (mg/L)	12	40.3	3.0	6.9
9	Mg (mg/L)	12	21.9	5.6	12.4
10	Na (mg/L)	12	165.0	42.0	57.3
11	NH3-N (mg N/L)	12	0.14	0.08	0.11
12	NO2+NO3 (mg N/L)	12	0.26	0.16	0.2
13	NO2-N (mgN/L)	12	0.10	0.05	0.07
14	NO3-N (mgN/L)	12	0.18	0.10	0.13
15	P-Tot (mgP/L)	12	0.160	0.100	0.128
16	SiO2 (mg/L)	12	14.0	1.0	9.4
17	SO4 (mg/L)	12	20.0	7.0	12
	BIOLOGICAL/BACTERIOLOGICAL				
1	BOD3-27 (mg/L)	12	35.0	1.4	9.8
2	COD (mg/L)	12	104.0	16.0	52
3	DO (mg/L)	10	8.5	0.0	3.7
4	DO_SAT% (%)	10	101	0	41
5	FCol-MPN (MPN/100mL)	12	4000	400	1758
6	Tcol-MPN (MPN/100mL)	12	8500	800	3600
	TRACE & TOXIC				
1	Al (mg/L)	12	0.12	0.06	0.1
	CHEMICAL INDICES				
1	HAR_Ca (mgCaCO3/L)	12	127	75	94
2	HAR_Total (mgCaCO3/L)	12	181	119	146
3	Na% (%)	12	62	35	43
4	RSC (-)	12	0.3	0.0	0
5	SAR (-)	12	5.6	1.5	2.1
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2017

Station Name : Dhadhar at Pingalwada (01 02 14 001)
Local River: Dhadhar

Division: Tapi Division, Surat
Sub-Division: LNSD, Bharuch

S.No	Parameters	Flood												Winter												Summer											
		Jun - Oct												Nov - Feb												Mar - May											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	161.4	151.8	123.4	9.433	7.448	32.31	12.51	6.445	41.60	57.45	11.13	6.328	3.093	3.710	5.235	5.230	2.057	6.178	1.836	5.554	8.436	8.674	6.610	8.155	1.752	0.000	4.230	3.351	1.268	3.799	0.000	0.000	3.595	5.341	6.016	5.783
2	EC_FLD (µmho/cm)			483	880	1000	902	938	737	1123	726	788	820		1491	909	679	952	1098	1057	1063	1200	875	1075	1200			1385	1206	1061	1173		1100	1100	1267	1267	800
3	EC_GEN (µmho/cm)	940	811	521	1246	1093	1044	1150	887	1172	699	586	447	1273	1282	1473	1329	1245	1177	920	1085	994	489	608	519	1460	1594	1480	1413	1413	1375	1329	1025	832	779	457	719
4	pH_FLD (pH units)			7.2	6.9	6.8	6.1	6.5	6.9	6.9	7.0	6.5	6.6		7.8	7.0	6.7	6.7	6.6	6.5	6.8	6.6	6.6	6.9	7.2		7.5	7.2	6.8	6.5	6.6	6.3	6.9	6.7	7.0	7.3	6.5
5	pH_GEN (pH units)	8.1	7.8	7.5	7.3	7.4	7.5	7.0	7.1	6.9	7.8	7.8	7.3	7.7	7.8	7.9	7.1	7.5	7.5	6.7	6.7	7.7	6.8	7.6	7.5	7.8	7.9	7.3	8.0	7.6	7.3	8.0	6.8	8.2	7.6	7.7	7.3
6	SS (mg/L)	93	141	146	298	324	350	491	264	397	179	294	146	99	229	296	353	412	394	333	346	319	203	210	213	115	237	329	640	467	407	450	353	285	390	175	303
7	TDS (mg/L)	677	548	373	840	707	765	809	596	763	467	378	303	987	932	989	828	758	853	593	697	666	310	404	335	1236	1178	989	1044	946	886	867	686	542	527	290	464
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	24.6	21.6	18.0	23.3	23.5	23.8	24.8	24.5	15.8	17.0	17.0	20.0	16.8	28.0	23.7	22.0	26.7	25.7	25.7	26.5	20.7	20.7	20.0	20.0	22.0
9	TS (mg/L)						1115	1306	885	1160	735	1039	764						1247	995	1041	984	659	793	535						1293	1317	1039	827	937	959	937
10	Turb (NTU)		7.5	7.3	2.0	2.8	8.0	2.0	18.0	3.4	2.6	5.8	5.0	1.0	1.3	1.0	1.8	1.5	0.8	1.5	2.0	2.8	3.3	1.8	2.0	1.3	1.7	1.3	3.0	2.0	1.3	2.0	2.0	2.3	1.7	2.7	6.7
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	4.2	0.0	8.6	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	315	148	147	139	136	130	131	125	103	124	147	115	387	193	226	102	101	135	95	99	113	111	171	120	229	215	209	143	118	103	162	123	121	153	113	154
3	Ca (mg/L)	37	35	34	37	39	36	38	36	37	42	47	39	39	40	40	40	39	39	40	37	36	35	69	33	40	43	39	40	40	43	37	37	37	46	35	42
4	Cl (mg/L)	475.9	119.5	90.2	222.2	190.2	226.3	208.3	143.0	104.4	72.4	63.2	67.6	183.3	163.1	256.1	268.9	208.7	234.9	162.9	99.6	129.8	68.9	67.5	80.5	271.4	215.8	256.3	295.0	234.8	284.9	350.5	77.9	108.7	71.7	62.3	130.0
5	CO3 (mg/L)	1.5	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	1.5	0.0	0.0	1.5	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	5.0	0.0	10.3	0.0	0.0	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	0.12	0.05	0.05	0.06	0.35	0.30	0.23	0.29	0.33	0.21	0.20	0.13	0.14	0.11	0.05	0.08	0.35	0.37	0.30	0.60	0.25	0.27	0.12	0.12	0.11
7	HCO3 (mg/L)	384	181	179	169	166	158	160	153	126	147	179	141	472	235	273	125	123	162	116	121	132	136	208	146	279	262	255	171	143	126	188	151	126	187	137	187
8	K (mg/L)		4.4	5.8	7.2	10.3	16.4	14.5	16.6	7.6	4.4	4.2	3.9		10.3	12.7	18.5	11.6	24.3	24.9	4.4	7.6	4.3	4.0	3.9	7.8	12.4	10.6	27.0	16.1	20.0	47.0	3.9	4.3	4.1	4.2	16.1
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	7.6	11.7	12.3	11.8	12.2	11.9	12.1	8.5	11.1	8.1	9.7	7.6	17.4	12.0	13.6	11.7	12.3	12.6	11.6	11.2	8.2	10.0	16.2	8.5	13.6
10	Na (mg/L)		87.0	65.5	140.6	133.3	161.5	140.9	95.1	70.4	48.1	44.9	46.2		121.5	182.3	165.5	131.6	152.8	102.9	60.8	91.5	46.8	41.3	47.5	203.0	152.4	182.0	211.8	153.2	169.0	236.1	59.0	78.3	48.2	44.7	89.0
11	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	0.11	0.40	0.05	0.06	4.85	11.26	4.26	0.08	0.18	0.15	0.20	0.12	0.11	0.10	0.05	0.09	16.23	11.26	0.38	0.10	0.17	0.16	0.11	0.12	0.10
12	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	0.19	0.02	0.01	0.10	0.60	0.55	0.37	0.27	0.31	0.27	0.23	0.19	0.20	0.25	0.12	0.22	0.71	0.68	0.34	0.27	0.34		0.20	0.19	0.21
13	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	0.07	0.00	0.00	0.01	0.05	0.09	0.06	0.08	0.12	0.11	0.08	0.07	0.07	0.03	0.00	0.05	0.06	0.06	0.05	0.02	0.12		0.07	0.07	0.08
14	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	0.13	0.02	0.01	0.09	0.55	0.46	0.31	0.20	0.19	0.16	0.15	0.12	0.13	0.22	0.12	0.17	0.65	0.62	0.29	0.25	0.22	0.15	0.12	0.12	0.13
15	o-PO4-P (mg P/L)						0.244	0.058	0.060										0.053	0.070	0.075										0.063	0.090					
16	P-Tot (mgP/L)	1.080	0.624	0.336	0.910	1.120	0.684	0.920	0.564	0.294	0.222	0.146	0.130	1.330	1.065	1.313	1.580	1.400	1.190	0.570	0.468	0.215	0.250	0.137	0.125	1.087	0.887	0.742	1.993	2.173	1.307	0.440	0.460	0.233	0.153	0.163	0.130
17	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	11.0	23.8	22.4	27.6	26.1	18.9	23.4	10.0	12.5	10.0	8.9	9.8	9.5	21.7	23.6	28.0	24.3	19.0	25.3	10.0	8.7	10.7	8.7	10.0	6.7
18	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	10.8	17.2	28.5	14.3	43.4	43.8	26.9	39.4	23.3	14.4	10.4	6.0	13.5	46.3	32.5	15.4	65.0	58.6	22.5	34.4	13.0	15.5	12.0	9.0	12.0
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	2.4	8.0	6.0	19.5	12.5	8.5	4.5	3.1	2.0	1.4	4.0	2.3	7.1	12.7	33.0	37.3	18.0	27.3	8.7	5.3	1.8	0.9	3.0	3.0	25.7
2	COD (mg/L)											73.2	34.4										68.0	40.0	64.0										54.0	52.0	65.3
3	DO (mg/L)			5.5	5.5	3.6	5.5	4.5	7.6	2.1	2.9	1.4	2.8		5.1	6.2	5.0	5.1	5.0	8.0	4.1	2.3	2.4	1.8	5.4			7.1	4.5	5.2	4.7		4.7	1.6	1.8	2.0	3.1
4	DO_SAT% (%)			70	69	45	68	55	90	25	34	17	33		62	72	59	60	61	96	40	24	25	21	57			81	56	63	57		53	17	22	20	35
5	FCol-MPN (MPN/100mL)										2380	960	2400									6000	2625	925	1300								3267	1200	733	1300
6	Tcol-MPN (MPN/100mL)										5670	1780	4860									30000	5150	1800	2800								11067	2500	1633	2567
	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	0.10	0.02	0.08	0.15	0.10	0.10	0.13	0.08	0.11	0.17	0.14	0.10	0.11	0.07	0.07	0.26	0.11	0.06	0.11	0.10	0.13	0.16	0.13	0.07	0.09
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	93	87	86	92	98	91	94	89	92	104	118	97	98	99	100	99	99	98	100	91	90	88	172	83	99	107	97	100	100	107	93	92	94	114	89	104
2	HAR_Total (mgCaCO3/L)	138	122	126	141	148	142	140	138	119	139	168	128	147	150	149	150	148	148	135	138	124	128	203	156	149	163	146	152	153	155	139	126	135	182	124	161
3	Na% (%)		50	48	65	63	59	64	54	54	42	37	43		62	71	66	64	64	57	48	58	43	31	39	74	65	71	67	66	67	72	50	55	37	43	48
4	RSC (-)	3.6	0.6	0.5	0.4	0.1	0.4	0.2	0.0	0.1	0.0	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	0.0	1.6	1.0	1.3	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1
5	SAR (-)		3.3	2.5	5.1	4.8	5.8	5.1	3.5	2.8	1.8	1.6	1.8		4.3	6.5	5.9	4.7	5.5	3.9	2.3	3.6	1.8	1.3	1.7	7.3	5.2	6.6	7.5	5.4	5.9	8.8	2.3	2.9	1.6	1.8	3.0
	PESTICIDES																																				

Pesticides, Trace and Toxic element analysis

Station Name: Dhadhar at Pingalwada (01 02 14 001)
Local River: Dhadhar

Division: Tapi Division, surat
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	01.12.16	01.04.17	01.04.17
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 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
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	0.0011	1.9225	0.002
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	0.00007	1.9	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	0.00405	0	0.022
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		0.00549	13.5	0.315
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	0.00614	6	0.003
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	0.00111	0	0.008
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	0.0354	25.78	1.079
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	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-	-	-						

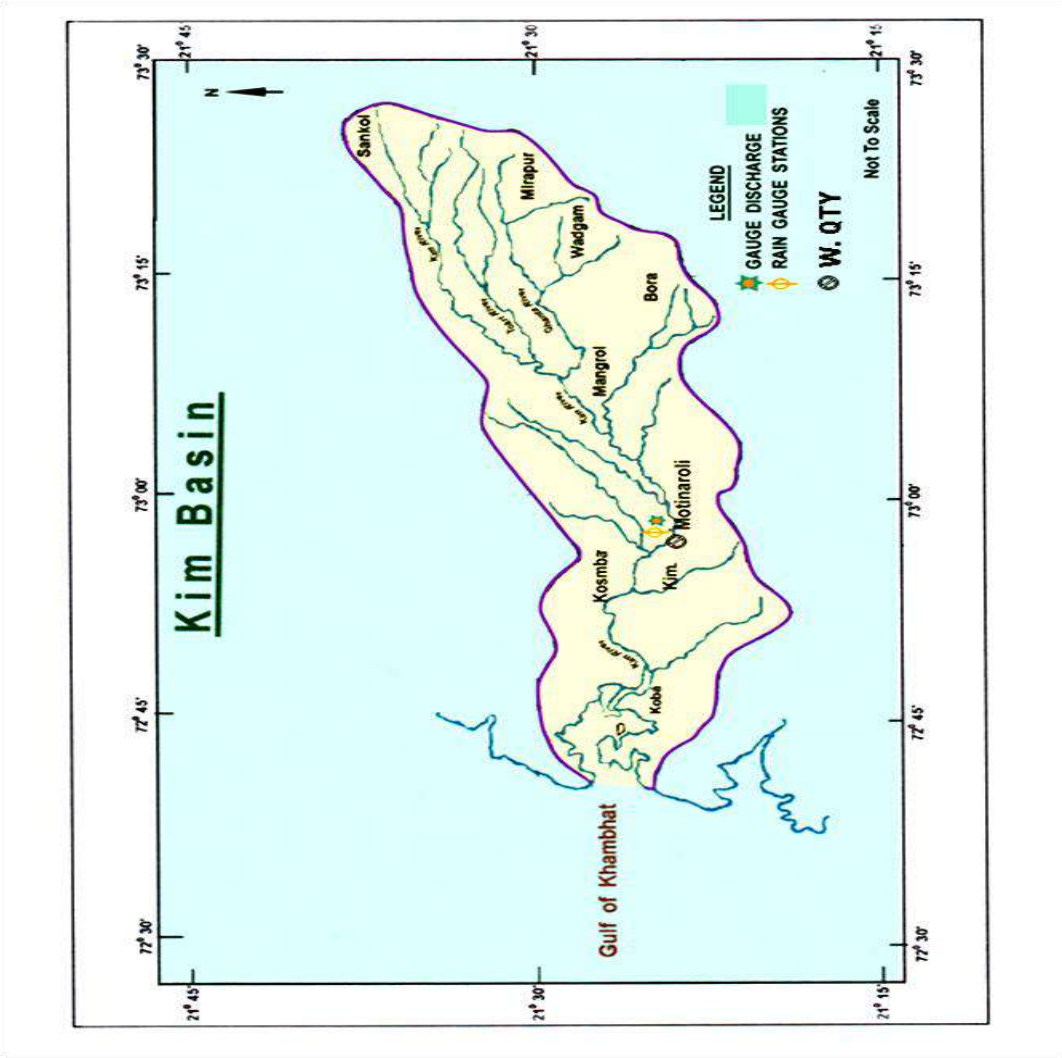
WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

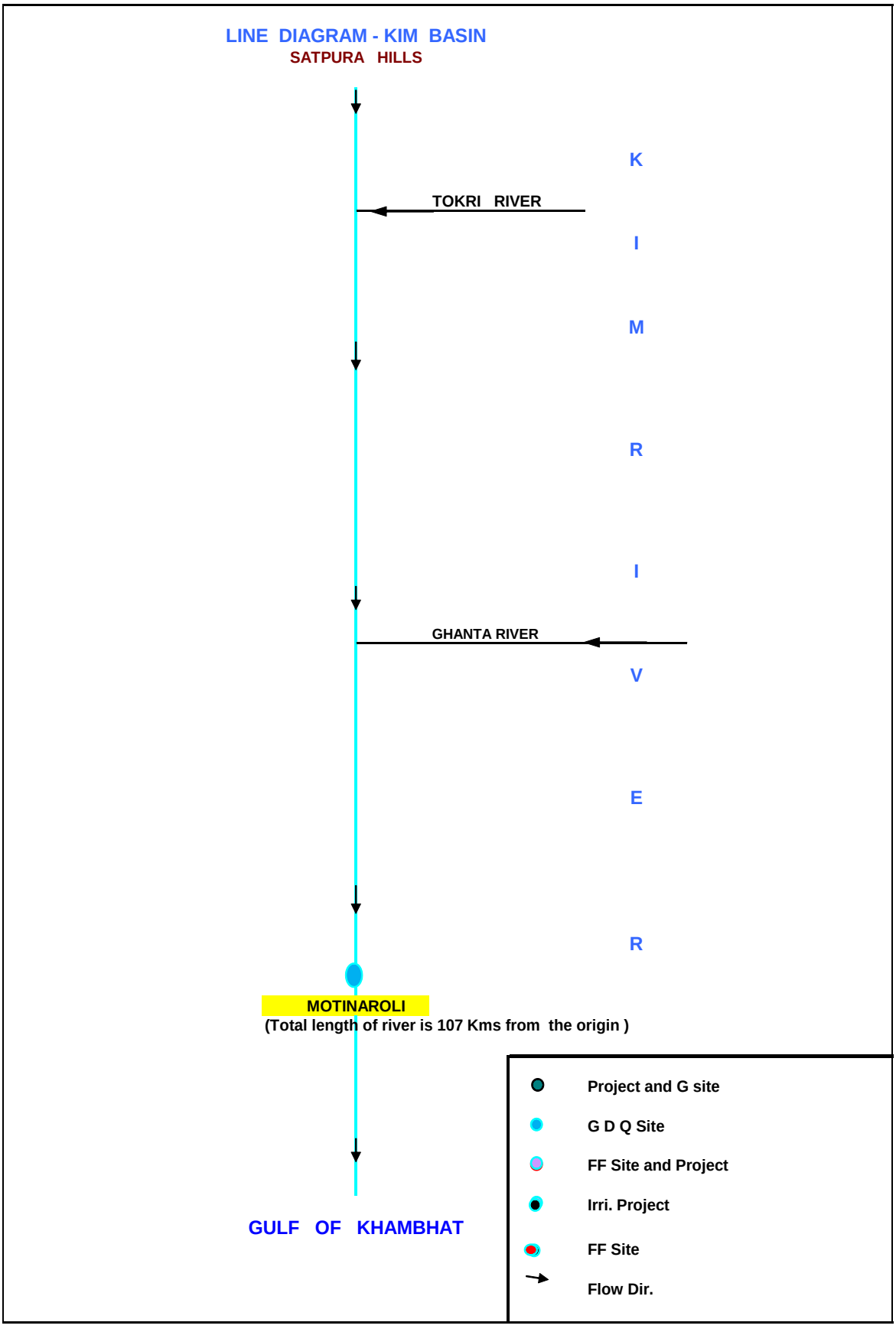
12. KIM BASIN

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	**:**	**2016-2017**
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 : 2016-2017													
Station Name: Kim at Motinaroli (01 02 16 001)													Division: Tapi Division, Surat
Local River: Kim													Sub Division: LNSD, Bharuch
S.No	Parameters	01/06/2016	01/07/2016	01/08/2016	01/09/2016	01/10/2016	01/11/2016	01/12/2016	02/01/2017	01/02/2017	01/03/2017	01/04/2017	01/05/2017
	PHYSICAL												
1	Q (cumec)	7.300	0.000	6.685	7.748	9.841	8.355	8.821	0.000	4.435	10.09	1.390	11.17
2	Colour_Cod (-)	Clear	Light Brown	Light Brown	Light Brown	Light Brown	Clear	Light Brown	Clear	Clear	Clear	Clear	Clear
3	EC_FLD (µmho/cm)	360	430	430	510	400	874	510	580	466	508	470	523
4	EC_GEN (µmho/cm)	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free	odour free
5	Odour_Code (-)	8.3					8.0	7.8	8.2	8.0			
6	pH_FLD (pH units)	8.1	8.1	7.7	7.8	8.0	7.7	8.3	7.4	8.2	8.1	8.1	8.0
7	pH_GEN (pH units)	110	140	300	170	140	300	202	200	140	156	200	170
8	SS (mg/L)	230	280	280	330	260	569	320	375	312	328	310	400
9	TDS (mg/L)	28.0	28.0	28.0	29.0	28.0	27.0	13.0	12.0	18.0	27.0	29.0	28.0
10	Temp (deg C)	1743	1595	830	1181	976	869	686	575	452	836	455	570
11	TS (mg/L)	1.0	1.0	8.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
12	Turb (NTU)												
	CHEMICAL	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	Alk-Phen (mgCaCO3/L)	120	131	70	120	98	110	147	212	140	120	110	200
2	ALK-TOT (mgCaCO3/L)	32	32	34	50	36	32	36	46	30	28	48	44
3	Ca (mg/L)	70.0	52.0	70.0	95.0	70.0	70.0	58.0	68.0	60.0	75.0	70.0	128.0
4	Cl (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
5	CO3 (mg/L)	0.13	0.13	0.14	0.14	0.14	0.14	0.13	0.14	0.15	0.14	0.13	0.14
6	F (mg/L)	146	160	85	146	120	134	179	259	171	146	134	244
7	HCO3 (mg/L)	4.0	3.6	3.8	3.8	4.2	3.6	4.2	4.4	4.7	3.6	4.1	6.8
8	K (mg/L)	9.7	8.0	4.9	12.0	7.3	9.7	17.0	25.5	17.0	18.2	4.9	29.2
9	Mg (mg/L)	50.0	40.0	40.0	50.0	40.0	50.0	38.0	52.0	44.0	46.0	44.0	85.0
10	Na (mg/L)	0.13	0.12	0.06	0.13	0.13	0.09	0.11	0.12	0.13	0.13	0.07	0.13
11	NH3-N (mg N/L)	0.21	0.20	0.18	0.20	0.21	0.23	0.26	0.20	0.18	0.18	0.20	0.20
12	NO2+NO3 (mg N/L)	0.09	0.08	0.05	0.08	0.08	0.10	0.08	0.07	0.08	0.06	0.09	0.08
13	NO2-N (mgN/L)	0.12	0.12	0.13	0.12	0.13	0.13	0.18	0.13	0.10	0.12	0.11	0.12
14	NO3-N (mgN/L)	0.130	0.140	0.140	0.140	0.130	0.120	0.100	0.140	0.140	0.140	0.110	0.150
15	P-Tot (mgP/L)	10.0	10.0	10.0	10.0	8.0	9.0	12.0	8.0	8.0	10.0	6.0	11.0
16	SiO2 (mg/L)	8.0	12.0	10.0	16.0	12.0	12.0	10.0	18.0	6.0	10.0	20.0	10.0
17	SO4 (mg/L)												
	BIOLOGICAL/BACTERIOLOGICAL	1.4	2.0	1.0	3.1	0.6	1.2	1.4	2.0	1.4	1.8	1.8	1.8
1	BOD3-27 (mg/L)	68.0	56.0	40.0	28.0	27.0	144.0	16.0	12.0	48.0	20.0	12.0	20.0
2	COD (mg/L)	8.4					6.4	7.1	6.3	7.7	7.9	7.5	7.3
3	DO (mg/L)	107					80	67	58	81	99	97	93
4	DO_SAT% (%)	2000	800	400	1200	1400	600	1600	1400	900	1200	1200	1800
5	FCol-MPN (MPN/100mL)	3400	1600	900	2500	2400	1600	3600	2600	1600	2000	2600	3600
6	Tcol-MPN (MPN/100mL)												
	TRACE & TOXIC	0.10	0.12	8.00	0.12	0.10	0.09	0.08	0.14	0.13	0.12	0.08	0.12
1	Al (mg/L)												
	CHEMICAL INDICES	80	80	85	125	90	80	90	115	75	70	120	110
1	HAR_Ca (mgCaCO3/L)	121	113	105	175	121	121	161	222	146	146	141	232
2	HAR_Total (mgCaCO3/L)	47	43	44	38	41	47	33	33	39	40	40	44
3	Na% (%)	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	RSC (-)	2.0	1.6	1.7	1.6	1.6	2.0	1.3	1.5	1.6	1.7	1.6	2.4
5	SAR (-)	2.0	1.6	1.7	1.6	1.6	2.0	1.3	1.5	1.6	1.7	1.6	2.4
	PESTICIDES												

Water Quality Summary for the period 2016-2017

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)	364	33.46	0.000	6.778
2	EC_FLD (µmho/cm)	12	874	360	505
3	EC_GEN (µmho/cm)	5	8.3	7.8	8.1
4	pH_FLD (pH units)	12	8.3	7.4	7.9
5	pH_GEN (pH units)	12	300	110	186
6	SS (mg/L)	12	569	230	333
7	TDS (mg/L)	12	29.0	12.0	24.6
8	Temp (deg C)	12	1743	452	897
9	TS (mg/L)	12	8.0	1.0	1.8
10	Turb (NTU)				
	CHEMICAL	12	0.0	0.0	0
1	Alk-Phen (mgCaCO3/L)	12	212	70	131
2	ALK-TOT (mgCaCO3/L)	12	50	28	37
3	Ca (mg/L)	12	128.0	52.0	73.8
4	Cl (mg/L)	12	0.0	0.0	0
5	CO3 (mg/L)	12	0.15	0.13	0.14
6	F (mg/L)	12	259	85	160
7	HCO3 (mg/L)	12	6.8	3.6	4.2
8	K (mg/L)	12	29.2	4.9	13.6
9	Mg (mg/L)	12	85.0	38.0	48.3
10	Na (mg/L)	12	0.13	0.06	0.11
11	NH3-N (mg N/L)	12	0.26	0.18	0.2
12	NO2+NO3 (mg N/L)	12	0.10	0.05	0.08
13	NO2-N (mgN/L)	12	0.18	0.10	0.13
14	NO3-N (mgN/L)	12	0.150	0.100	0.132
15	P-Tot (mgP/L)	12	12.0	6.0	9.3
16	SiO2 (mg/L)	12	20.0	6.0	12
17	SO4 (mg/L)				
	BIOLOGICAL/BACTERIOLOGICAL	12	3.1	0.6	1.6
1	BOD3-27 (mg/L)	12	144.0	12.0	40.9
2	COD (mg/L)	8	8.4	6.3	7.3
3	DO (mg/L)	8	107	58	85
4	DO_SAT% (%)	12	2000	400	1208
5	FCol-MPN (MPN/100mL)	12	3600	900	2367
6	Tcol-MPN (MPN/100mL)				
	TRACE & TOXIC	12	8.00	0.08	0.77
1	Al (mg/L)				
	CHEMICAL INDICES	12	125	70	93
1	HAR_Ca (mgCaCO3/L)	12	232	105	150
2	HAR_Total (mgCaCO3/L)	12	47	33	41
3	Na% (%)	12	0.4	0.0	0
4	RSC (-)	12	2.4	1.3	1.7
5	SAR (-)	12	2.4	1.3	1.7
	PESTICIDES				

Water Quality Seasonal Average for the period :2005-2017

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

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

S.No	Parameters	Flood												Winter												Summer											
		Jun - Oct												Nov - Feb												Mar - May											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	PHYSICAL																																				
1	Q (cumec)	100.0	110.7	186.8	11.14	7.799	9.513	11.94	5.698	50.40	182.4	14.46	6.315	3.795	3.713	3.124	2.836	2.492	2.968	1.925	1.899	9.454	8.095	6.761	5.403	4.529	3.083	3.384	3.184	2.051	1.727	0.851	0.439	4.258	3.448	5.791	7.549
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	426	882	917	1167	1214	1159	690	765	595	1231	491	555	608	539	790	662	611	632	755	666	608	686	545	372	500
4	pH_FLD (pH units)			8.0	7.4	7.0	7.0	7.5	7.6	7.6	8.0	8.1	8.3		7.9	8.2	7.0	6.9	7.5	8.0	8.0	7.8	8.2	8.3	8.0	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	7.9	8.2	8.0	8.2	7.6	7.8	7.9	7.5	7.9	8.3	8.0	8.0	7.9	8.0	8.1	7.6	7.8	7.9	7.6	7.8	7.9	8.3	8.0	8.0	8.1
6	SS (mg/L)	78	127	172	253	241	205	228	180	310	168	186	172	84	200	232	337	412	230	245	200	453	222	184	211	109	205	200	221	228	297	210	215	197	213	127	175
7	TDS (mg/L)	374	304	311	560	517	534	467	363	598	342	308	276	733	650	777	758	715	453	488	405	783	322	355	394	440	485	437	424	422	489	540	414	427	362	240	346
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	28.2	24.1	31.3	21.5	22.8	22.5	25.0	27.0	20.5	22.8	19.0	26.0	17.5	30.7	29.5	26.0	28.0	26.3	27.3	28.5	27.5	20.7	23.3	23.7	28.0
9	TS (mg/L)						739	695	543	908	507	984	1265						683	733	605	1235	687	604	646						872	641	629	624	777	756	620
10	Turb (NTU)		20.5	16.3	1.8	4.0	0.6	2.3	2.6	6.0	6.8	3.0	2.6	1.0	1.0	1.0	1.3	1.0	0.3	1.5	1.5	1.3	1.3	1.0	1.5	1.0	1.0	1.0	2.3	1.0	0.6	1.0	1.0	1.7	1.3	1.0	1.0
	CHEMICAL																																				
1	Alk-Phen (mgCaCO3/L)	5.2	2.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	4.0	0.0	0.0	4.3	0.0	3.7	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	4.2	0.0	1.7	0.0	0.0	0.0
2	ALK-TOT (mgCaCO3/L)	176	103	117	129	110	132	111	102	87	105	138	108	222	136	181	125	136	95	85	85	97	122	152	152	174	122	123	120	117	100	134	90	108	143	105	143
3	Ca (mg/L)	35	32	31	36	37	39	34	34	33	37	42	37	36	38	38	38	37	37	36	37	35	37	46	36	37	34	34	37	37	44	37	34	37	33	31	40
4	Cl (mg/L)	91.1	64.9	51.9	111.8	117.0	279.2	108.6	167.8	75.6	66.8	65.6	71.4	154.7	132.2	149.6	243.3	171.7	170.4	132.8	85.4	111.8	71.9	63.0	64.0	85.3	121.3	68.0	194.6	145.5	190.6	214.5	80.1	106.3	67.7	56.7	91.0
5	CO3 (mg/L)	3.2	2.4	1.2	1.2	1.2	0.0	0.0	0.0	1.2	4.8	0.0	0.0	2.5	0.0	4.5	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	5.0	0.0	2.0	0.0	0.0	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	0.14	0.10	0.05	0.06	0.26	0.29	0.22	0.29	0.30	0.20	0.14	0.12	0.14	0.05	0.07	0.06	0.37	0.37	0.27	0.15	0.15	0.23	0.12	0.13	0.14
7	HCO3 (mg/L)	215	121	140	133	132	161	135	125	104	119	168	131	271	166	211	152	166	116	104	104	113	149	185	186	212	144	151	146	142	122	153	110	127	175	128	175
8	K (mg/L)		0.8	3.1	2.8	4.2	13.5	10.1	6.8	6.2	4.4	3.4	3.9		2.0	3.4	10.0	7.4	11.4	12.4	3.3	5.5	4.4	3.5	4.2	1.0	4.7	1.0	1.7	10.2	18.2	19.8	2.7	3.7	3.5	4.1	4.8
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	8.4	10.4	11.2	10.9	11.9	10.4	11.3	7.7	8.8	7.9	12.2	10.9	17.3	11.0	9.7	8.8	11.7	11.7	10.4	11.5	7.8	9.1	18.3	6.5	17.4
10	Na (mg/L)		46.6	36.2	74.9	76.1	202.4	72.9	110.6	48.5	47.1	45.5	44.0		93.4	109.6	150.8	114.3	99.3	82.1	48.5	75.1	45.4	42.7	46.0	73.1	83.0	50.5	126.0	95.8	110.4	150.8	50.1	70.3	46.3	42.0	58.3
11	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	0.11	0.20	0.10	0.10	0.08	0.07	0.07	0.11	0.17	0.17	0.14	0.13	0.11	0.05	0.08	0.08	0.58	0.07	0.08	0.15	0.12	0.17	0.12	0.12	0.11
12	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	0.20	0.13	0.02	0.14	0.28	0.30	0.22	0.23	0.32	0.26	0.20	0.20	0.22	0.06	0.03	0.16	0.40	0.33	0.22	0.23	0.24		0.21	0.18	0.19
13	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	0.08	0.02	0.00	0.01	0.04	0.03	0.05	0.07	0.12	0.10	0.08	0.07	0.08	0.00	0.00	0.03	0.03	0.05	0.06	0.01	0.08		0.08	0.06	0.08
14	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	0.12	0.11	0.02	0.13	0.24	0.27	0.16	0.16	0.20	0.16	0.12	0.13	0.13	0.06	0.03	0.13	0.37	0.27	0.16	0.22	0.16	0.15	0.14	0.11	0.12
15	o-PO4-P (mg P/L)						0.086	0.057	0.070										0.067	0.055	0.080									0.060	0.080					
16	P-Tot (mgP/L)	0.305	0.162	0.216	0.248	0.484	0.376	0.275	0.272	0.260	0.198	0.144	0.136	0.132	0.279	0.674	0.370	0.525	0.295	0.990	0.850	0.210	0.225	0.122	0.125	0.087	0.074	0.096	0.745	0.353	0.700	0.810	0.235	0.253	0.150	0.133	0.133
17	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	9.6	19.3	21.9	26.1	24.2	15.0	17.6	12.8	15.0	9.7	8.6	10.3	9.3	18.4	21.8	26.1	20.9	14.6	20.4	12.0	9.0	10.2	6.6	8.0	9.0
18	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	11.6	25.3	37.6	8.4	20.2	26.5	11.4	21.1	18.5	13.6	8.7	8.0	11.5	8.7	15.7	6.4	27.1	23.0	13.5	21.3	12.0	13.0	8.0	7.7	13.3
	BIOLOGICAL/BACTERIOLOGICAL																																				
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	1.6	3.3	2.9	4.5	10.8	2.7	8.8	9.5	1.4	1.5	2.9	2.6	1.5	0.6	4.7	0.7	1.5	1.1	3.9	1.1	1.3	2.6	2.3	1.0	1.8
2	COD (mg/L)											65.2	43.8										40.0	35.0	55.0										32.7	30.7	17.3
3	DO (mg/L)			9.3	8.5					6.6	7.1	6.4	8.4		7.0	8.0	8.2	6.7	7.5			5.9	6.6	6.9	6.9		6.8	7.8	7.5	7.2			6.1	6.1	6.1	6.9	7.5
4	DO_SAT% (%)			129	110					85	91	83	107		95	93	96	76	84			68	71	85	72		88	96	97	89			82	68	72	81	96
5	FCol-MPN (MPN/100mL)										840	500	1160									1200	425	525	1125								933	467	667	1400
6	Tcol-MPN (MPN/100mL)										1680	940	2160									6000	950	1050	2350								2333	900	1333	2733
	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	1.69	0.01	0.03	0.07	0.07	0.03	0.14	0.08	0.10	0.17	0.15	0.08	0.11	0.04	0.05	0.09	0.05	0.03	0.08	0.09	0.15	0.15	0.08	0.10	0.11
	CHEMICAL INDICES																																				
1	HAR_Ca (mgCaCO3/L)	88	80	78	91	92	96	85	84	83	92	105	92	89	95	95	94	92	92	90	93	86	93	115	90	92	86	86	93	92	109	91	85	94	82	77	100
2	HAR_Total (mgCaCO3/L)	129	112	108	130	139	144	128	123	108	116	152	127	133	142	141	143	136	139	122	129	119	143	161	162	138	126	123	142	140	152	139	118	131	158	104	173
3	Na% (%)		38	37	51	53	69	52	56	46	46	40	42		57	58	67	61	58	56	43	56	41	36	38	55	57	47	65	58	58	67	47	52	39	46	41
4	RSC (-)	1.1	0.0	0.3	0.1	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.1	1.9	0.1	0.8	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
5	SAR (-)		1.8	1.5	2.8	2.8	7.6	2.9	4.3	2.0	1.9	1.6	1.7		3.4	3.9	5.5	4.3	3.7	3.2	1.9	3.0	1.7	1.5	1.6	2.8	3.2	2.0	4.6	3.5	3.9	5.6	2.0	2.7	1.7	1.8	1.9
	PESTICIDES																																				

Pesticides, Trace and Toxic element analysis

Station Name: Kim at Motinaroli (01 02 16 001)
Local River: Kim

Division: Tapi Division, surat
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	01.12.16	01.04.17	01.04.17
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	Analysis done by WQL-III Lab, UGD, Hyderabad	Analysis done by NRWQL, New Delhi
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	0.00004	0.9775	0.001
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	0.00003	2.2	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	0.00287	0	0.004
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		0.00428	6.4	0.008
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	0.00335	0.57	0.006
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	0.00836	2.2	0.005
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	0.0041	7.57	0.022
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	-	-	-	-	-	-	-		-	-	-	-		-	-	-	-								

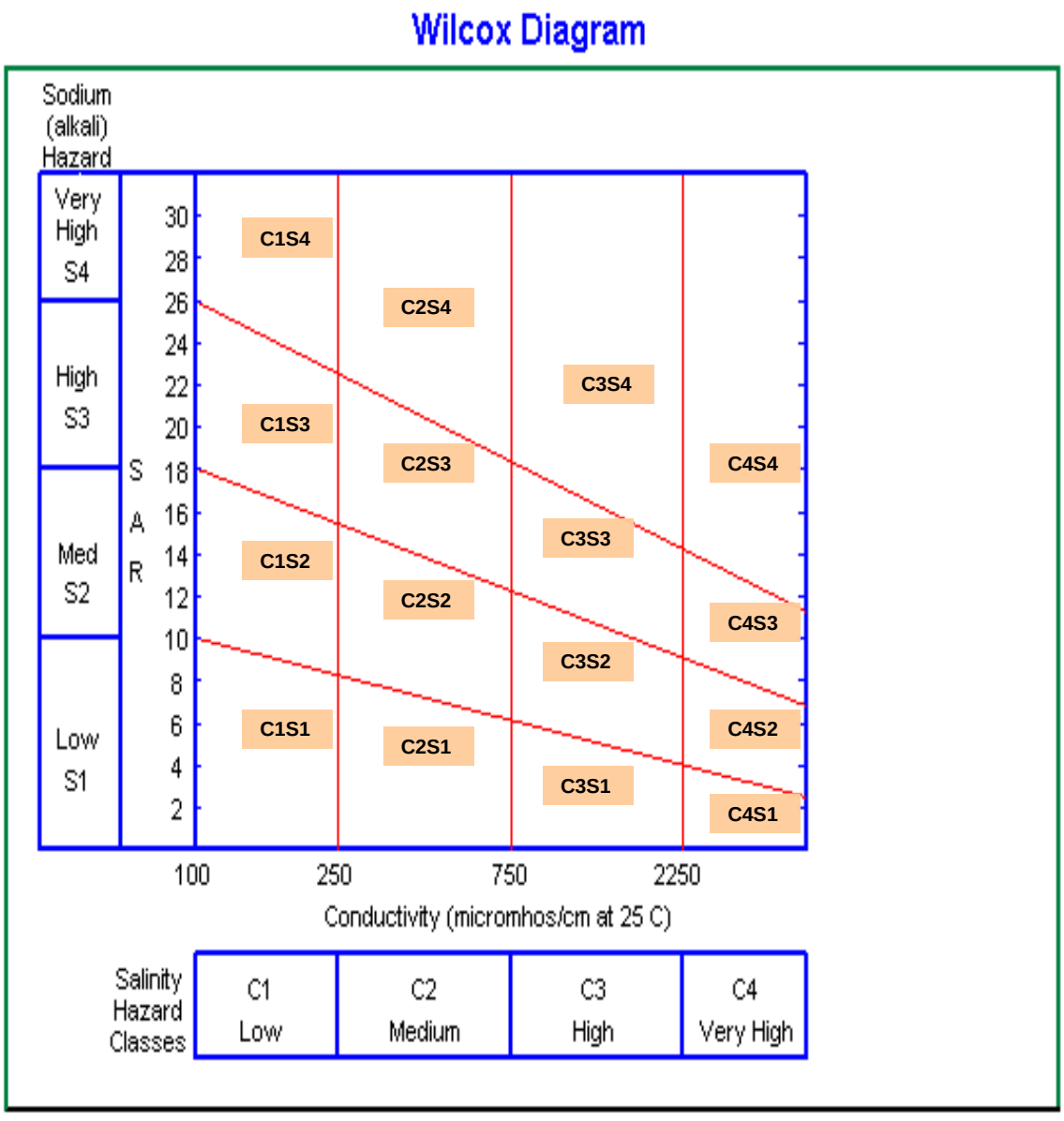
WQL - III Lab at UGD, Hyderabad conducts the analysis of Trace and Toxic element and Pesticides
NRWQ Lab at HOC, Noida, New Delhi conducts the analysis of Trace and Toxic element only, which started from September 2011 onwords

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)I ,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