

केवल सरकारी उपयोग हेतु  
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# जल गुणवत्ता वर्ष पुस्तिका

## WATER QUALITY YEAR BOOK

जून 2015- मई 2016

June 2015 - May 2016

# सोन बेसिन

## SONE BASIN

जल विज्ञानीय प्रेक्षण परिमण्डल

HYDROLOGICAL OBSERVATION CIRCLE

केन्द्रीय जल आयोग

CENTRAL WATER COMMISSION

वाराणसी

VARANASI

## **PREFACE**

Water is a prime natural resource and basic human need. The National Water Policy lays stress on planning and development of water resources on a national perspective. The prime requisite of water resources planning is indeed an efficient information system on the quantity and quality of this time and space variable precious natural asset. In present times due to fast pace of development and increasing population the quality of waters in our river systems is under tremendous pressure, thereby posing a challenge to preserve the quality of waters and at the same time to clean up the already polluted rivers.

The Central Water Commission in its capacity as an apex technical organisation in the field of water resources development endeavours the gigantic task of collection and compilation of Water Quality data incorporating the quality and quantity of available waters in various basins of the country. The Water Quality Books of various river basins of the country are being published by Central Water Commission.

The present volume contains information and trend on various water quality parameters for the year 2015-2016 measured in Sone river basin, a tributary of Ganga river.

The valuable guidance and inspiration of Shri Narendra Kumar, Member, RM, CWC, New Delhi and Shri S. K. Sibbal, Chief Engineer, Upper Ganga Basin Organisation, CWC, Lucknow is gratefully acknowledged.

I would like to place on record the special contribution made by officers and staff of Hydrological Observation Circle, Varanasi and Middle Ganga Division-III, Varanasi in compilation of information and publication of the report in present form.

It is hoped that this publication will be found useful for the planners, managers and users in the field of water resources.

December, 2016

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VARANASI

# CONTENTS

| SERIAL No. | TITLE                                                  | PAGE  |
|------------|--------------------------------------------------------|-------|
| <b>1</b>   | <b>INTRODUCTION</b>                                    |       |
|            | 1.1 Scope                                              | 1     |
|            | 1.2 Source of information                              | 1     |
|            | 1.3 Observation Technique                              | 1-2   |
| <b>2</b>   | <b>WATER QUALITY DATA</b>                              |       |
|            | 2.1 Explanatory notes                                  | 2-3   |
|            | 2.2 Method of presentation                             | 4     |
| <b>3</b>   | <b>WATER QUALITY<br/>Tolerance and classification</b>  | 4     |
|            | Table-1                                                | 5     |
|            | Table-2                                                | 6     |
|            | Table-3                                                | 7     |
|            | Table-4 & Table-5                                      | 8     |
| <b>4</b>   | <b>Water Quality Scenario/Trend</b>                    | 9     |
|            | 4.1 Water Quality Network                              | 9     |
|            |                                                        |       |
|            | 4.2 Scenario/Trends different water quality parameters | 9-40  |
|            |                                                        |       |
| <b>5</b>   | <b>HISTORY SHEET &amp; DATA</b>                        |       |
|            | Kuldah Bridge at Sone                                  | 41-54 |
|            | Chopan at Sone                                         | 55-68 |
|            | Duddhi at Kanhar                                       | 69-84 |
| <b>6</b>   | <b>INDEX MAP</b>                                       | 85    |
| <b>7</b>   | <b>ABBREVIATIONS AND SYMBOLS</b>                       | 86    |

# 1. INTRODUCTION

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## 1.1. Scope

Rapidly increasing population, rising standard of living ,exponential growth of industrialized and urbanization have exposed the Water Resources in general and rivers in particular to various form of degradation. It is therefore necessary to keep vigilant watch of quality of available fresh waters whose major sources in our country are rivers.

## 1.2. Source of Information

Middle Ganga Division No. III, Varanasi under the Hydrological Observation Circle, Central Water Commission, Varanasi is conducting Water Quality observations at three sites in Sone sub-basin. The finalised data for the year 2015-2016 is presented in the book. The details of sites are given in Table 1 and same has been located in index map .

**T A B L E 1**

| Sl.No                                | Name of site          | Station Code |
|--------------------------------------|-----------------------|--------------|
| <b>Middle Ganga Division No. III</b> |                       |              |
| 1.                                   | Kuldah Bridge at Sone | GGTOOT3      |
| 2.                                   | Chopan at Sone        | GGTOOL5      |
| 3.                                   | Duddhi at Kanhar      | GGT3OE8      |

## 1.3. Observation Technique

Water samples from all the Water Quality stations are collected on 1st working day of the month and transported to divisional laboratory where systematic analysis is conducted for the determination of constituents like pH, Specific Conductance, Potassium (as K), Sodium (as Na), Calcium (as Ca), Magnesium (as Mg), Iron (as Fe), Nitrogen Ammoniacal (as NH<sub>4</sub>-N), Carbonate (as CO<sub>3</sub>), Bicarbonate (as HCO<sub>3</sub>),

Chloride (as Cl), Fluoride (as F), Sulphate (as SO<sub>4</sub>), Nitrate (as NO<sub>3</sub>), Nitrite (as NO<sub>2</sub>), Phosphate (as PO<sub>4</sub> ), Silica (as SiO<sub>2</sub>) and Boron (as B).

pH and Specific Conductance are determined by digital pH meter and conductivity meter. Cl<sup>-</sup>, CO<sub>3</sub><sup>--</sup>, HCO<sub>3</sub><sup>-</sup> , Ca<sup>++</sup> and Mg<sup>++</sup> are estimated by titration method. SO<sub>4</sub><sup>--</sup> is estimated by turbidimetric method with the help of Nephelometer. Na<sup>+</sup> and K<sup>+</sup> estimation is done by the method of flame emission with the help of Flame photometer and rest by the method of colorimetric estimation with the help of U-V Spectrophotometer.

In addition to the above, Dissolved Oxygen is also estimated. Biochemical Oxygen Demand, Chemical Oxygen Demand and Microbiological Parameters such as Total Coliform & Fecal Coliform are determined at selected sites.

## **2. WATER QUALITY DATA**

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### **2.1 Explanatory Notes**

The explanatory notes, described hereunder, are designed to assist in the interpretation of various parameters contained in the data presented subsequently.

- i) The river water samples are collected at a regular frequency of once in a month usually on the 1<sup>st</sup> working day from the main flowing portion of the stream as per uniform protocol.
- ii) Well Water analysis is also carried out twice in a year i.e. 1<sup>st</sup> working day of November & May.
- iii) Dissolved Oxygen is measured at the site laboratory within an hour of collection of samples.
- iv) The other water quality parameters are analysed at the divisional laboratory, Varanasi/National River Water Quality laboratory, New Delhi.

v) Chemical Indices, namely, Hardness Number, Sodium Percentage, Sodium Adsorption Ratio and Residual Sodium Carbonate are calculated as follows :

a. Hardness Number (HAR) is calculated by adding the total  $\text{Ca}^{++}$  and  $\text{Mg}^{++}$  in the sample expressed as equivalent parts of  $\text{CaCO}_3$ .

$$\text{H.N.} = (\text{Ca}^{++} + \text{Mg}^{++}) \times 50$$

Where Ionic concentrations being in m.e./litre.

b. Sodium Percentage (S.P.) is given by

$$\text{S.P.} = (\text{Na}^+ \times 100) / (\text{Ca}^{++} + \text{Mg}^{++} + \text{Na}^+ + \text{K}^+)$$

c. Sodium Adsorption Ratio (S.A.R.) is given by

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

Where the ionic concentration being in m.e./litre.

d. Residual Sodium Carbonate (R.S.C.) is given by

$$\text{R.S.C.} = (\text{CO}_3^{--} + \text{HCO}_3^-) - (\text{Ca}^{++} + \text{Mg}^{++})$$

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

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

vii) The gauging station code number is a unique seven column alpha-numeric reference number which facilitates storage and retrieval of water quality data in data banks. The first column is identifier of either an integral river basin or for convenience, a region having several contiguous river catchments. This is followed by a column which identifies an independent river system which either have one or more outlets to the sea or crosses international border to enter another country. The third, fourth and fifth column spaces denote first, second and third order tributaries respectively from the mouth upstream. The sixth and seventh column spaces indicate the location of the gauging station in one of the 225 slots earmarked on the river. The blank column spaces are filled by zero.

## 2.2 Method of Presentation

In the succeeding pages, stationwise water quality data and its trend is presented, comprising history sheet and water quality analysis tables.

History sheet gives concise description of the water quality observation station. The water quality analysis tables are given seasonwise (flood, winter, summer) for the river water and for well water during the month of November & May. The samples of water quality analysis are collected once a month as already mentioned in para 2.1 above.

## 3. WATER QUALITY TOLERANCE AND CLASSIFICATION

As per ISI-IS: 2296-1982, the tolerance limits of parameters are specified as per classified use of water ( Table 1,2,3,4,5 Annexed ) depending on various uses of water. The following classifications have been adopted in India.

| <b>Classification</b> | <b>Type of use</b>                                                           |
|-----------------------|------------------------------------------------------------------------------|
| Class A               | Drinking water source without conventional treatment but After disinfection. |
| Class B               | Outdoor bathing.                                                             |
| Class C               | Drinking water source with conventional treatment followed by disinfection.  |
| Class D               | Fish culture and wild life propagation .                                     |
| Class E               | Irrigation , Industrial cooling or controlled waste disposal.                |

# TABLE-1

## TOLERANCE LIMITS FOR INLAND SURFACE WATERS, CLASS – A

| S. No.   | Characteristic                                                      | Tolerance        |
|----------|---------------------------------------------------------------------|------------------|
| (i)      | pH value                                                            | 6.5 to 8.5       |
| (ii)     | Dissolved Oxygen, mg/l, ((Min))                                     | 6.0              |
| (iii)    | Bio-chemical Oxygen Demand ((Max))                                  | 2.0              |
| (iv)     | Total Coliform Organisms, MPN/100 ml,((Max))                        | 50               |
| (v)      | Colour, Hazen units, ((Max))                                        | 10               |
| (vi)     | Odour                                                               | unobjectionable  |
| (vii)    | Taste                                                               | Agreeable taste  |
| (viii)   | Total Dissolved Solids, mg/l, (Max)                                 | 500              |
| (ix)     | Total Hardness (as CaCO <sub>3</sub> ), mg/l ,(Max)                 | 300              |
| (x)      | Calcium Hardness (as CaCO <sub>3</sub> ), mg/l, (Max)               | 200              |
| (xi)     | Magnesium (as CaCO <sub>3</sub> ), mg/l,(Max)                       | 100              |
| (xii)    | Copper (as Cu), mg/l, (Max)                                         | 1.5              |
| (xiii)   | Iron (as Fe), mg/l,(Max)                                            | 0.3              |
| (xiv)    | Manganese (as Mn), mg/l,(Max)                                       | 0.5              |
| (xv)     | Chlorides (as Cl), mg/l,(Max)                                       | 250              |
| (xvi)    | Sulphate (as SO <sub>4</sub> ), mg/l ,(Max)                         | 400              |
| (xvii)   | Nitrates (as NO <sub>2</sub> ), mg/l,(Max)                          | 20               |
| (xviii)  | Fluorides (as F,) mg/l,(Max)                                        | 1.5              |
| (xix)    | Phenolic compounds(as C <sub>6</sub> H <sub>5</sub> OH), mg/l,(Max) | 0.002            |
| (xx)     | Mercury (as Hg), mg/l ,(Max)                                        | 0.001            |
| (xxi)    | Cadmium (as Cd), mg/l,(Max)                                         | 0.01             |
| (xxii)   | Selenium (as Se), mg/l ,(Max)                                       | 0.01             |
| (xxiii)  | Arsenic (as As), mg/l,(Max)                                         | 0.05             |
| (xxiv)   | Cyanides (as CN), mg/l, (Max)                                       | 0.05             |
| (xxv)    | Lead (as Pb), mg/l, (Max)                                           | 0.1              |
| (xxvi)   | Zinc (as Zn), mg/l, (Max)                                           | 15               |
| (xxvii)  | Chromium (asCr <sub>6+</sub> ), mg/l,(Max)                          | 0.05             |
| (xxviii) | Anionic detergents, (as MBAS), mg/l ,(Max) .                        | 0.2              |
| (xxix)   | Poly-nuclear aromatic hydrocarbons (PAH),                           | 0.2              |
| (xxx)    | (Min)eral oil, mg/l ,(Max)                                          | 0.01             |
| (xxxi)   | Barium (as Ba), mg/l ,(Max)                                         | 1.0              |
| (xxxii)  | Silver (as Ag), mg/l (Max)                                          | 0.05             |
| (xxxiii) | Pesticides                                                          | Absent           |
| (xxxiv)  | Alpha emitters, µc/ml, (Max)                                        | 10 <sup>-9</sup> |
| (xxxv)   | Beta emitters, µc/ml, (Max)                                         | 10 <sup>-8</sup> |

## TABLE- 2

### TOLERANCE LIMITS FOR INLAND SURFACE WATERS, CLASS – B

| S. No. | Characteristic                                                       | Tolerance        |
|--------|----------------------------------------------------------------------|------------------|
| (i)    | pH Value                                                             | 6.5 to 8.5       |
| (ii)   | Dissolved Oxygen, mg/l,(Min)                                         | 5.0              |
| (iii)  | Biochemical Oxygen Demand (5 days at 20 °C), (Max)                   | 3.0              |
| (iv)   | Total Coliform Organisms, MPN/100 ml, (Max)                          | 500              |
| (v)    | Fluorides (as F)<mg/l, (Max)                                         | 1.5              |
| (vi)   | Colour, Hazen units, (Max)                                           | 300              |
| (vii)  | Cyanides (as CN), mg/l, (Max)                                        | 0.05             |
| (viii) | Arsenic (as As), mg/l, (Max)                                         | 0.2              |
| (ix)   | Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH) mg/l, (Max) | 0.005            |
| (x)    | Chromium (as Cr <sup>6+</sup> ), mg/l, (Max)                         | 1.0              |
| (xi)   | Anionic detergents (as MBAS), mg/l, (Max)                            | 1.0              |
| (xii)  | Alpha emitters, µc/ml, (Max)                                         | 10 <sup>-8</sup> |

## TABLE- 3

### TOLERANCE LIMITS FOR INLAND SURFACE WATERS, CLASS – C

| S. No.  | Characteristic                                                        | Tolerance  |
|---------|-----------------------------------------------------------------------|------------|
| (i)     | pH Value                                                              | 6.5 to 8.5 |
| (ii)    | Dissolved Oxygen, mg/l (Min)imum                                      | 4.0        |
| (iii)   | Biochemical Oxygen Demand                                             | 3.0        |
| (iv)    | Total coliform organisms, MPN/100 ml, (Max)                           | 5000       |
| (v)     | Colour, Hazen units, (Max)                                            | 300        |
| (vi)    | Fluorides (as F), mg/l ,(Max)                                         | 1.5        |
| (vii)   | Cadmium (as Cd), mg/l, (Max)                                          | 0.01       |
| (viii)  | Chlorides (as Cl), mg/l, (Max)                                        | 600        |
| (ix)    | Chromium (as Cr <sup>6+</sup> ), mg/l, (Max)                          | 0.05       |
| (x)     | Cyanides (as CN), mg/l, (Max)                                         | 0.05       |
| (xi)    | Total Dissolved Solids, mg/l, (Max)                                   | 1500       |
| (xii)   | Selenium (as Se), mg/l, (Max)                                         | 0.05       |
| (xiii)  | Sulphates (as SO <sub>4</sub> ), mg/l, (Max)                          | 400        |
| (xiv)   | Lead (as Pb), mg/l, (Max)                                             | 0.1        |
| (xv)    | Copper (as Cu),mg/l,(Max)                                             | 1.5        |
| (xvi)   | Arsenic (as As), mg/l, (Max)                                          | 0.2        |
| (xvii)  | Iron (as Fe), mg/l, (Max)                                             | 50         |
| (xviii) | Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l, (Max) | 0.005      |
| (xix)   | Zinc (as Zn), mg/l, (Max)                                             | 15         |
| (xx)    | Insecticides, mg/l, (Max)                                             | Absent     |
| (xxi)   | Anionic detergents (as MBAS), mg/l, (Max)                             | 1.0        |
| (xxii)  | Oils and grease, mg/l, (Max)                                          | 0.1        |
| (xxiii) | Nitrates (as NO <sub>3</sub> ), mg/l,(Max)                            | 50         |
| (xxiv)  | Alpha emititers, µc/mg, (Max)                                         | 10-9       |
| (xxv)   | Beta emitters, µc/ml, (Max)                                           | 10-8       |

## TABLE-4

### TOLERANCE LIMITS FOR INLAND SURFACE WATERS, CLASS -D

| S. No. | Characteristic                                        | Tolerance  |
|--------|-------------------------------------------------------|------------|
| (i)    | pH value                                              | 6.5 to 8.5 |
| (ii)   | Dissolved Oxygen, mg/l, (Min).                        | 4.0        |
| (iii)  | Free Ammonia (as N), mg/l, (Max).                     | 1.2        |
| (iv)   | Electrical Conductance at 25 °C, $\mu$ S, (Max)       | 1000       |
| (v)    | Free Carbon Dioxide (as CO <sub>2</sub> ),mg/l, (Max) | 6.0        |
| (vi)   | Oils and Grease, mg/l, (Max)                          | 0.1        |
| (vii)  | Alpha emitters, $\mu$ c/ml, (Max)                     | $10^{-9}$  |
| (viii) | Beta emitters, $\mu$ c/ml, (Max)                      | $10^{-8}$  |

## TABLE- 5

### TOLERANCE LIMITS FOR INLAND SURFACE WATERS,CLASS -E

| S. No. | Characteristic                                   | Tolerance  |
|--------|--------------------------------------------------|------------|
| (i)    | pH value                                         | 6.0 to 8.5 |
| (ii)   | Electrical Conductance at 25°C, $\mu$ S, (Max)   | 2250       |
| (iii)  | Sodium Adsorption Ratio, (Max)                   | 26         |
| (iv)   | Boron (as B), mg/l, (Max)                        | 2.0        |
| (v)    | Total Dissolved Solids, (inorganic), mg/l, (Max) | 2100       |
| (vi)   | Sulphates (as SO <sub>4</sub> ), mg/l, (Max)     | 1000       |
| (vii)  | Chlorides (as Cl), Mg/l, (Max)                   | 600        |
| (viii) | Sodium Percentage, (Max)                         | 60         |
| (ix)   | Alpha emitters, $\mu$ c/ml, (Max)                | $10^{-9}$  |
| (x)    | Beta emitters, $\mu$ c/ml, (Max)                 | $10^{-8}$  |

## 4. WATER QUALITY SCENARIO/TREND

Surface water quality trends assists resource managers in identifying nature and extent of emerging water-quality concerns, planning remedial measures, evaluating their effectiveness and prioritization of pollution control effects. This section presents the scenario of different water quality parameters based on the results of data analysis of the **Chopan** and **Kuldahbridge** stations on river Sone and **Duddhi** station on river Kanhar which confluent with river Sone downstream of Chopan.

### 4.1 W.Q. Network :

| S.No. | Name of Site | River  | Class |
|-------|--------------|--------|-------|
| 1     | Kuldahbridge | Sone   | Trend |
| 2     | Chopan       | Sone   | Trend |
| 3     | Duddhi       | Kanhar | Trend |

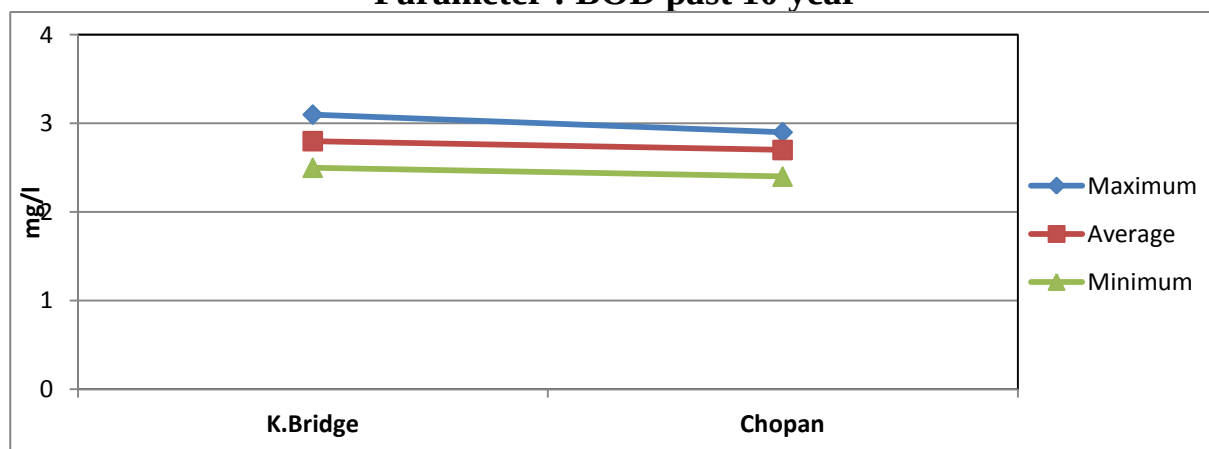
### 4.2. WATER QUALITY SCENARIO/TRENDS FOR RIVER SONE (MAIN STEM):

#### 4.2.1 Biological Oxygen Demand (BOD) in mg/l

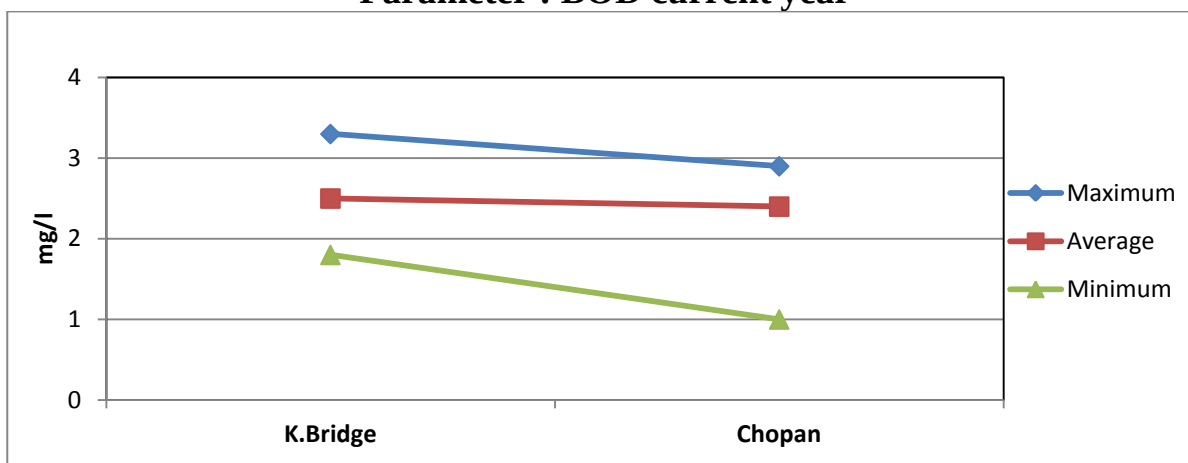
| Site Name<br>(From U/S to D/S) | Avg. of Yearly Maximum |               |              | Avg. of Yearly Minimum |               |              | Annual Average  |               |              |
|--------------------------------|------------------------|---------------|--------------|------------------------|---------------|--------------|-----------------|---------------|--------------|
|                                | Since inception        | Past 10 year* | Current year | Since inception        | Past 10 year* | Current year | Since inception | Past 10 year* | Current year |
| Site 1<br>Kuldahbridge         | -                      | 3.1           | 3.3          | -                      | 2.5           | 1.8          | -               | 2.8           | 2.5          |
| Site 2<br>Chopan               | -                      | 2.9           | 2.9          | -                      | 2.4           | 1.0          | -               | 2.7           | 2.4          |

\*BOD started from June 2009.

Parameter : BOD past 10 year



### Parameter : BOD current year

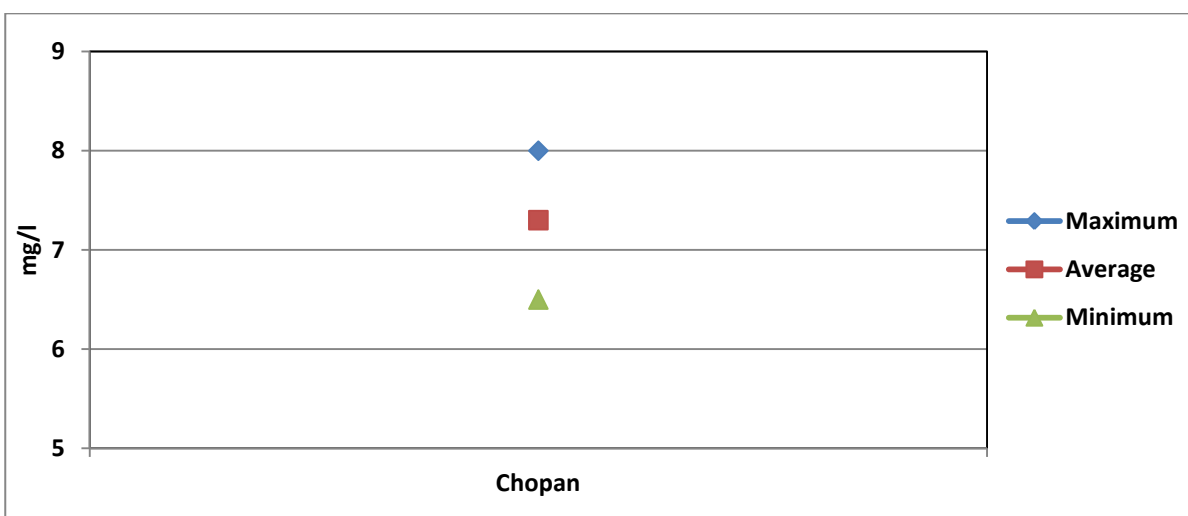


#### 4.2.2 Dissolved Oxygen (DO) in mg/l

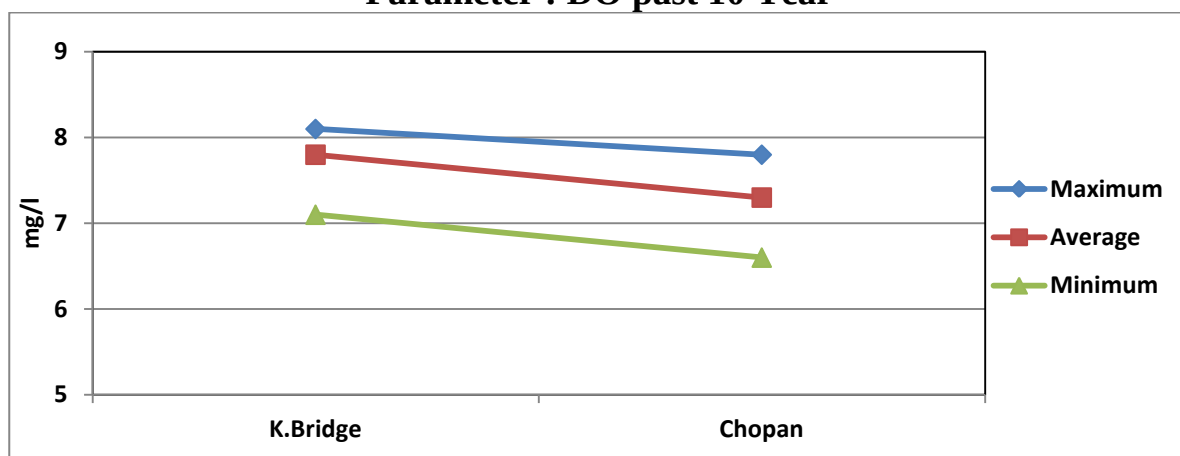
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                    |                 | Avg. of Yearly Minimum |                    |                 | Annual Average     |                    |                 |
|-----------------------------------|------------------------|--------------------|-----------------|------------------------|--------------------|-----------------|--------------------|--------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception | Past<br>10<br>year | Current<br>year |
| Site 1<br>Kuldahbridge            | -                      | 8.1                | 7.5             | -                      | 7.1                | 6.3             | -                  | 7.8                | 6.9             |
| Site 2<br>Chopan                  | 8.0                    | 7.8                | 7.8             | 6.5                    | 6.6                | 7.1             | 7.3                | 7.3                | 7.1             |

\*DO started from 2005 at Chopan , 2009 at Kuldahbridge.

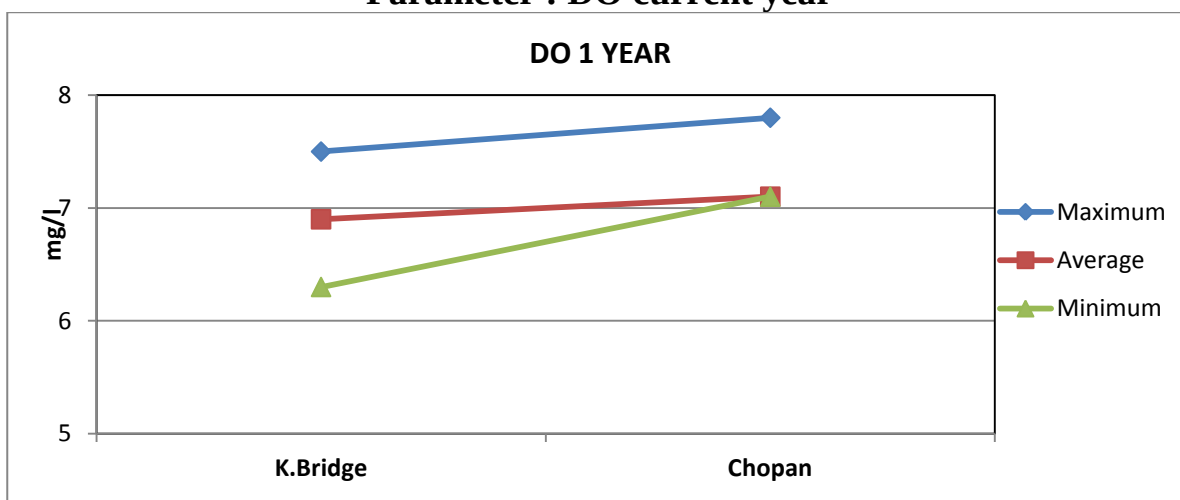
### Parameter : DO since inception



### Parameter : DO past 10 Year



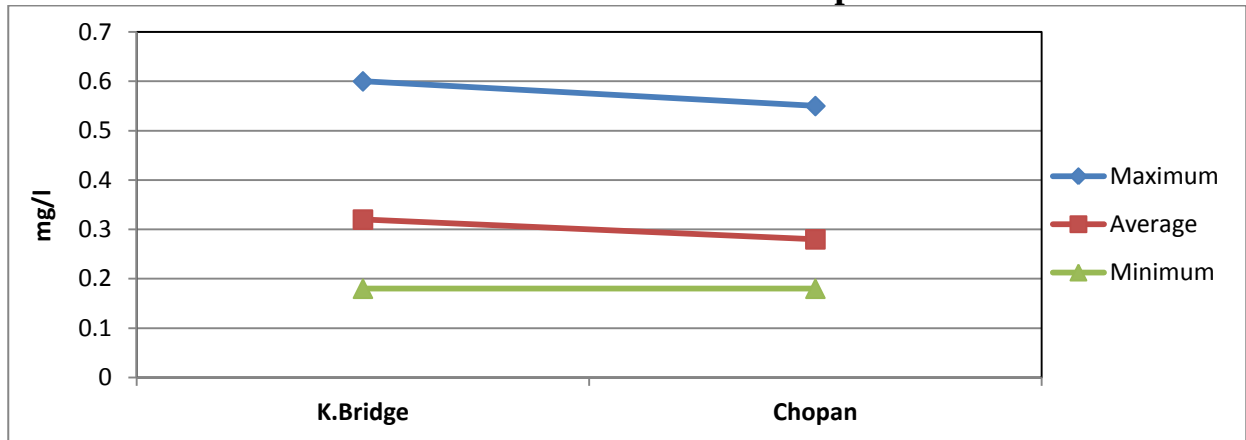
### Parameter : DO current year



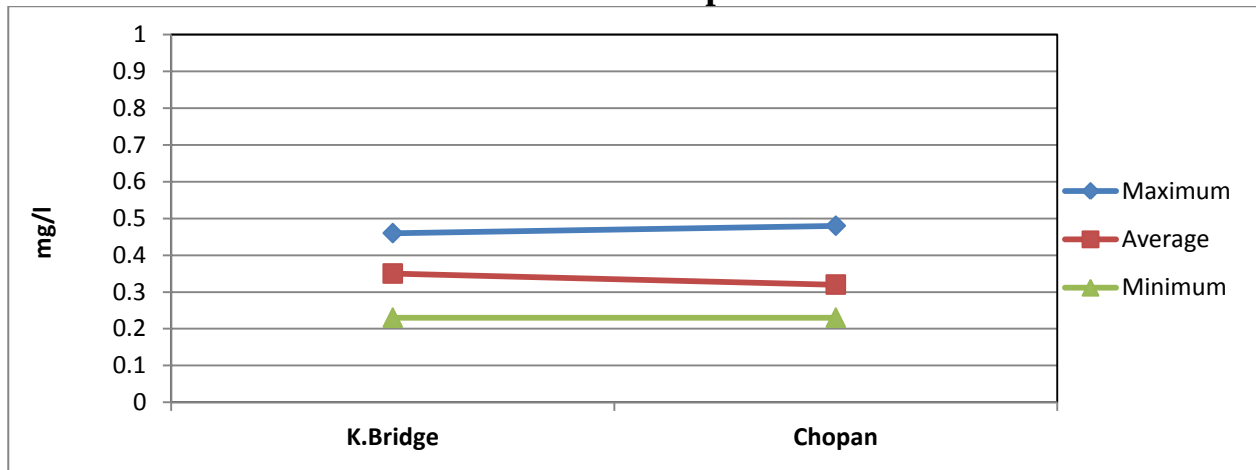
#### 4.2.3 Fluoride in mg/l

| Site Name<br>(From U/S to D/S) | Avg. of Yearly Maximum |              |              | Avg. of Yearly Minimum |              |              | Annual Average       |         |          |
|--------------------------------|------------------------|--------------|--------------|------------------------|--------------|--------------|----------------------|---------|----------|
|                                | Since inception        | Past 10 year | Current year | Since inception        | Past 10 year | Current year | Since inception from | 10 year | One year |
| Site 1<br>Kuldahbridge         | 0.6                    | 0.46         | 0.40         | 0.18                   | 0.23         | 0.20         | 0.32                 | 0.35    | 0.26     |
| Site 2<br>Chopan               | 0.55                   | 0.48         | 0.40         | 0.18                   | 0.23         | 0.22         | 0.28                 | 0.32    | 0.29     |

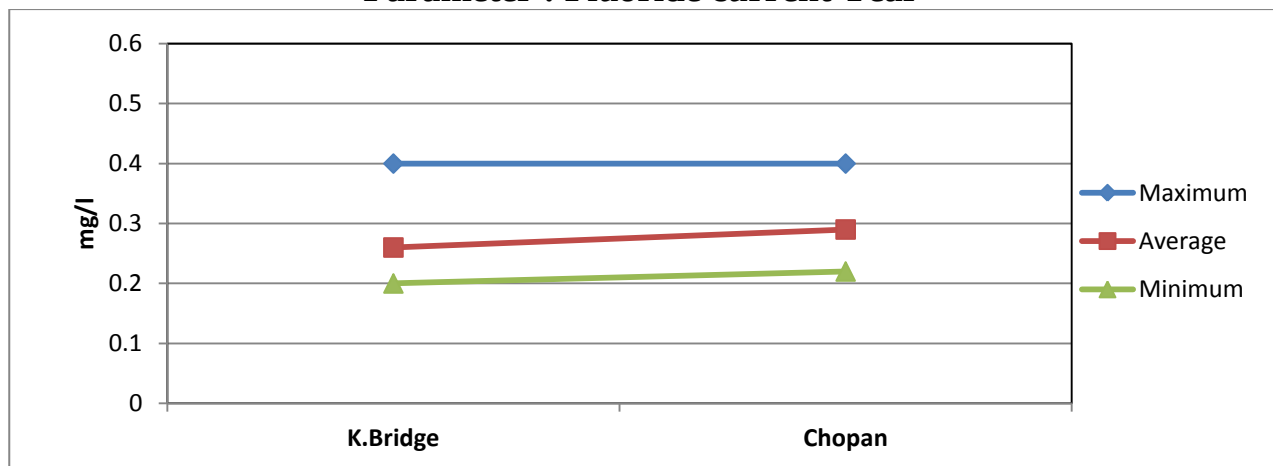
**Parameter : Fluoride since inception**



**Parameter : Fluoride past 10 Year**



**Parameter : Fluoride current Year**

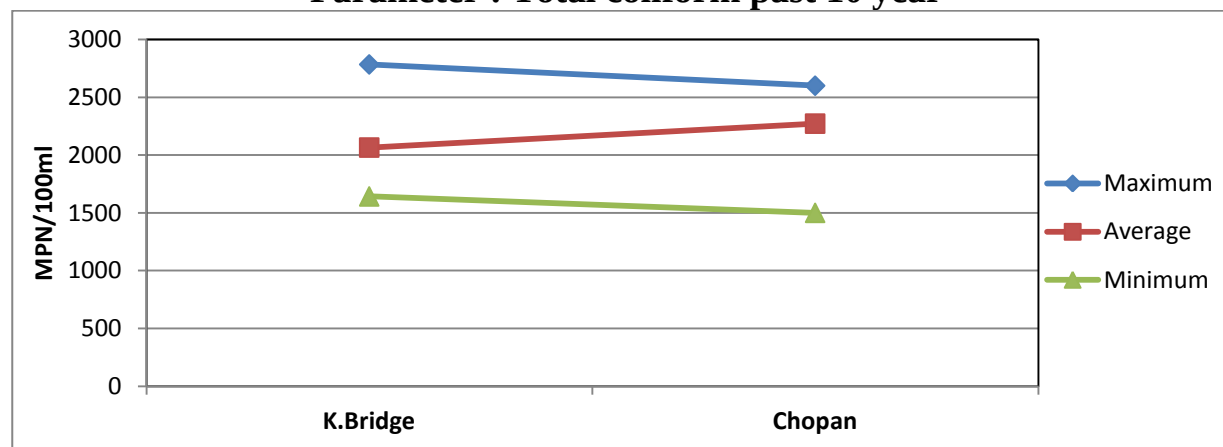


#### 4.2.4 Total coliform in MPN/100ml

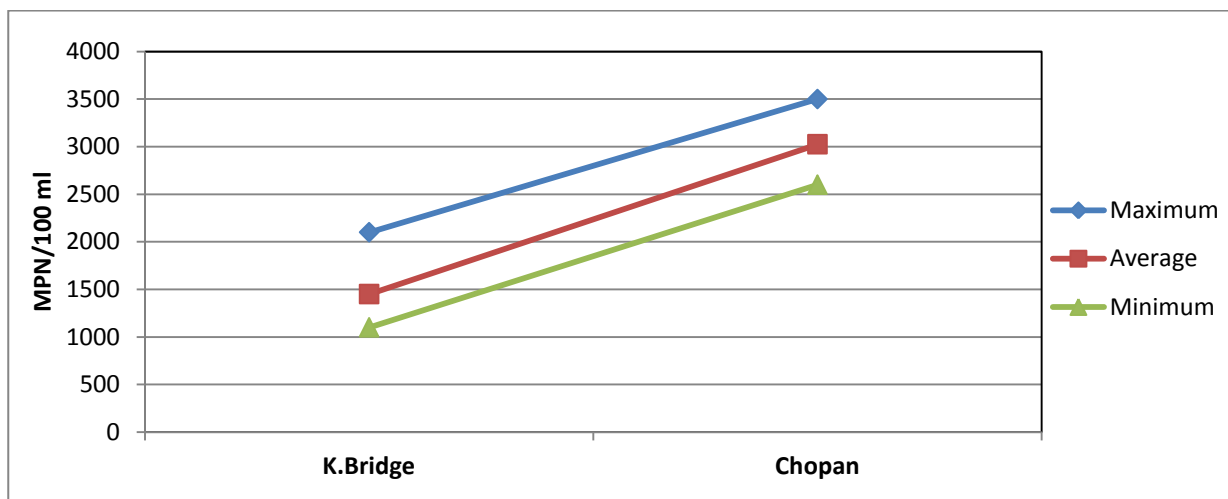
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                    |                 | Avg. of Yearly Minimum |                    |                 | Annual Average     |                    |                 |
|-----------------------------------|------------------------|--------------------|-----------------|------------------------|--------------------|-----------------|--------------------|--------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception | Past<br>10<br>year | Current<br>year |
| Site 1<br>Kuldahbridge            | -                      | 2784               | 2100            | -                      | 1642               | 1100            | -                  | 2065               | 1450            |
| Site 2<br>Chopan                  | -                      | 2600               | 3500            | -                      | 1500               | 2600            | -                  | 2272               | 3025            |

**Note :** Total coliform started from May 2007 at Kuldahbridge & Chopan.

**Parameter : Total coliform past 10 year**



**Parameter : Total coliform current year**

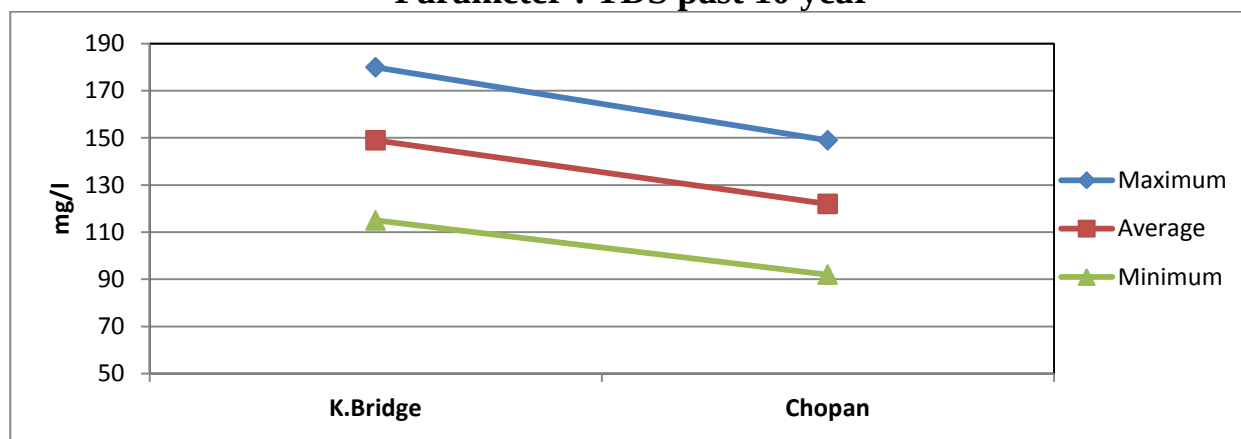


#### 4.2.5 Total Dissolved Solids (TDS) in mg/l

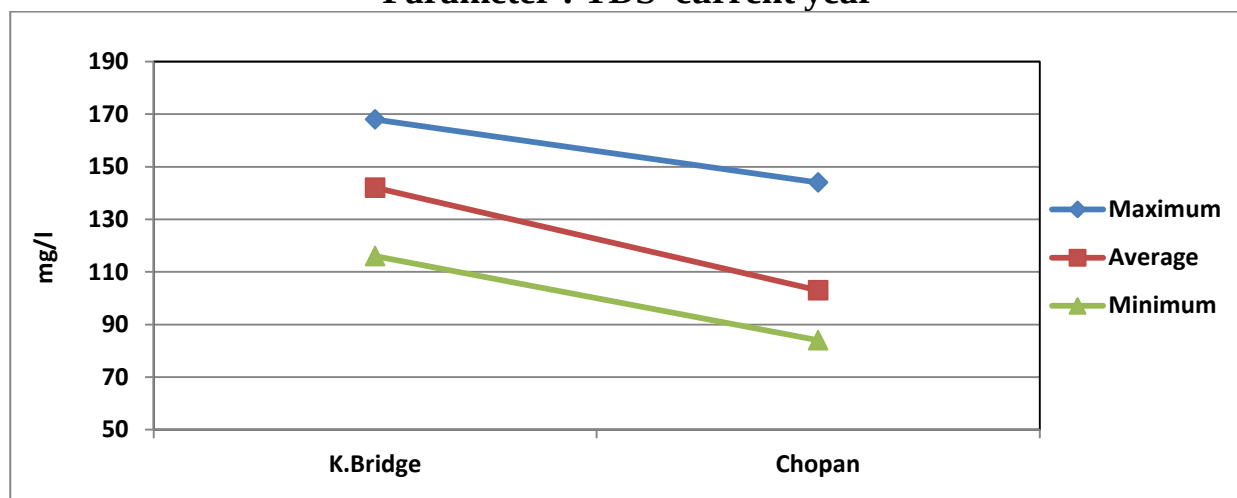
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                     |                 | Avg. of Yearly Minimum |                     |                 | Annual Average     |                     |                 |
|-----------------------------------|------------------------|---------------------|-----------------|------------------------|---------------------|-----------------|--------------------|---------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception | Past<br>10<br>year* | Current<br>year |
| Site 1<br>Kuldahbridge            | -                      | 180                 | 168             | -                      | 115                 | 116             | -                  | 149                 | 142             |
| Site 2<br>Chopan                  | -                      | 149                 | 144             | -                      | 92                  | 84              | -                  | 122                 | 103             |

\*TDS started from June 2009 at Kuldahbridge & Chopan.

**Parameter : TDS past 10 year**



**Parameter : TDS current year**



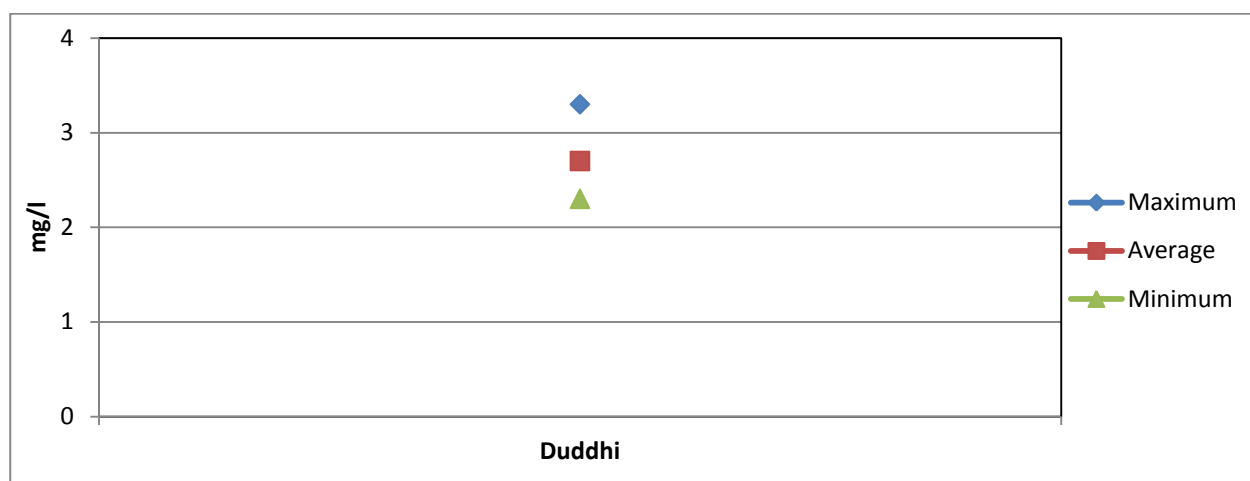
### 4.3. WATER QUALITY SCENARIO/TRENDS FOR RIVER KANHAR (SONE TRIBUTARY):

#### 4.3.1 Biological Oxygen Demand (BOD) in mg/l

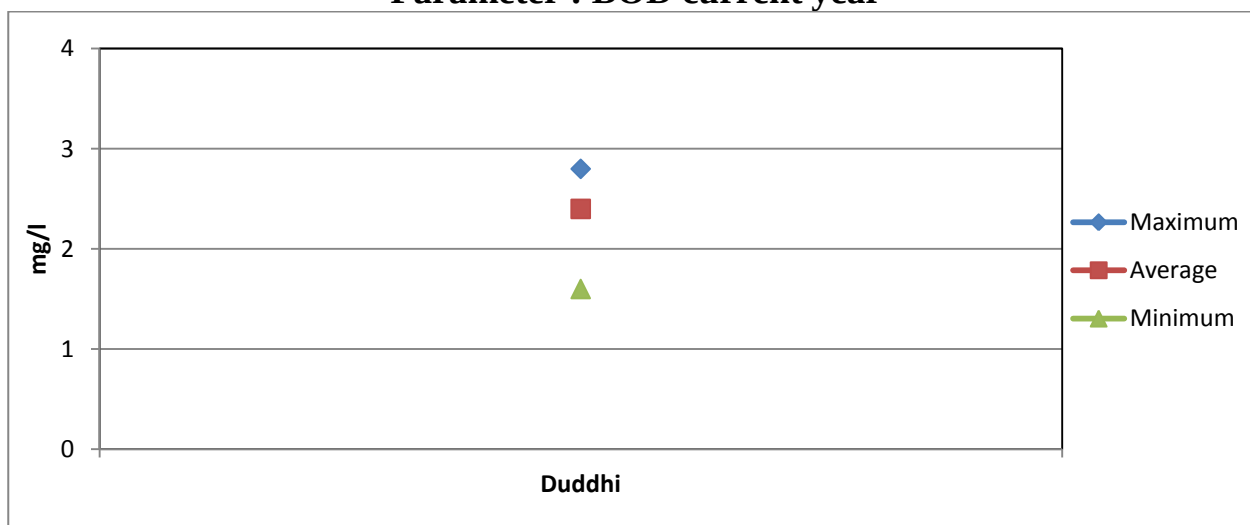
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                     |                 | Avg. of Yearly Minimum |                     |                 | Annual Average     |                     |                 |
|-----------------------------------|------------------------|---------------------|-----------------|------------------------|---------------------|-----------------|--------------------|---------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception | Past<br>10<br>year* | Current<br>year |
| Site 1 Duddhi                     | -                      | 3.3                 | 2.8             | -                      | 2.3                 | 1.6             | -                  | 2.7                 | 2.4             |

\*BOD started from June 2009.

#### Parameter : BOD past 10 year



#### Parameter : BOD current year

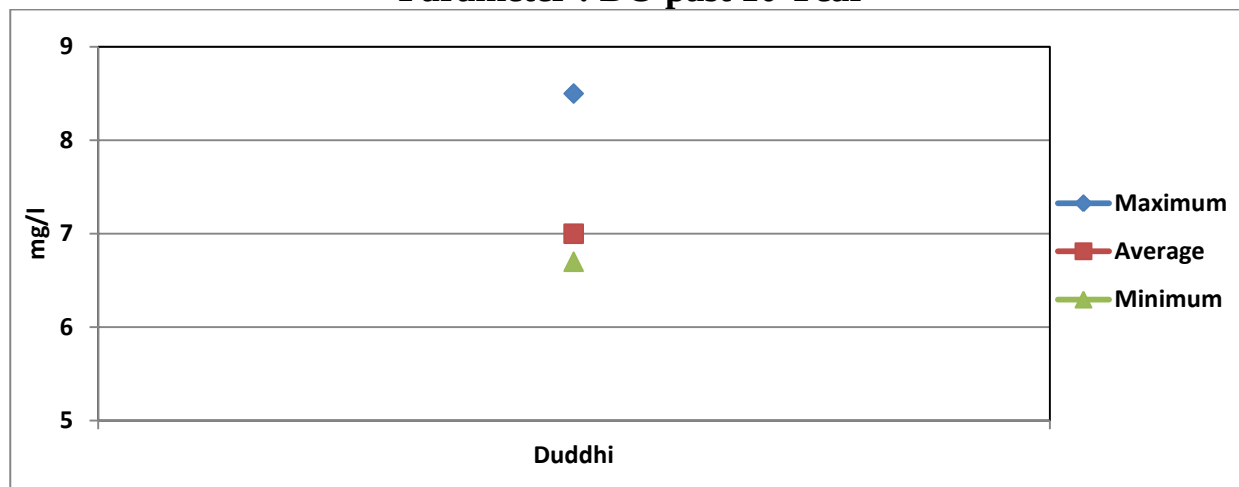


#### 4.3.2 Dissolved Oxygen (DO) in mg/l

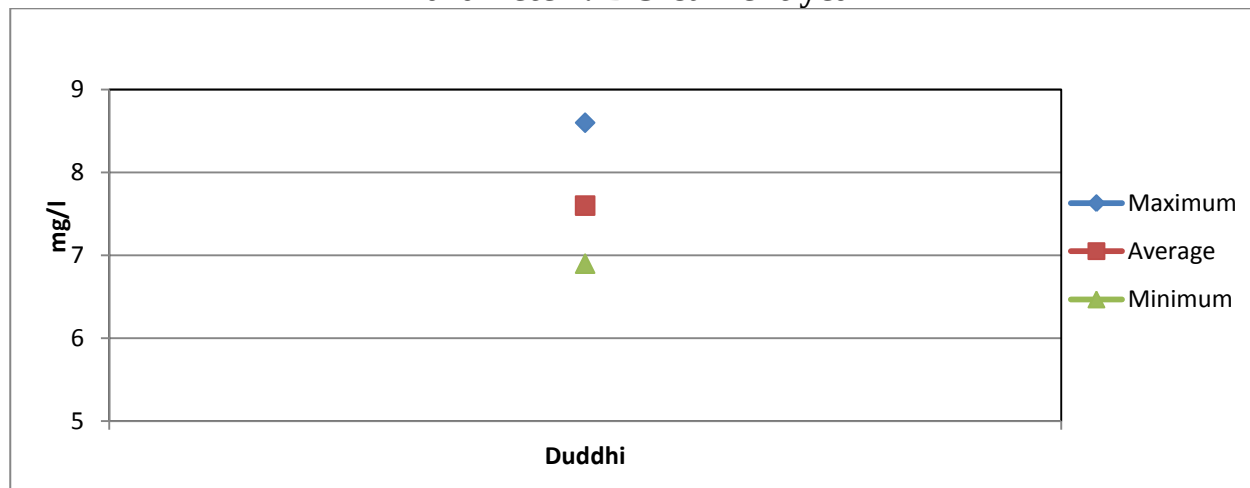
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                    |                 | Avg. of Yearly Minimum |                    |                 | Annual Average     |                    |                 |
|-----------------------------------|------------------------|--------------------|-----------------|------------------------|--------------------|-----------------|--------------------|--------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception | Past<br>10<br>year | Current<br>year |
| Site 1 Duddhi                     | -                      | 8.5                | 8.6             | -                      | 6.7                | 6.9             | -                  | 7.0                | 7.6             |

\*DO started from 2009 at Duddhi.

**Parameter : DO past 10 Year**



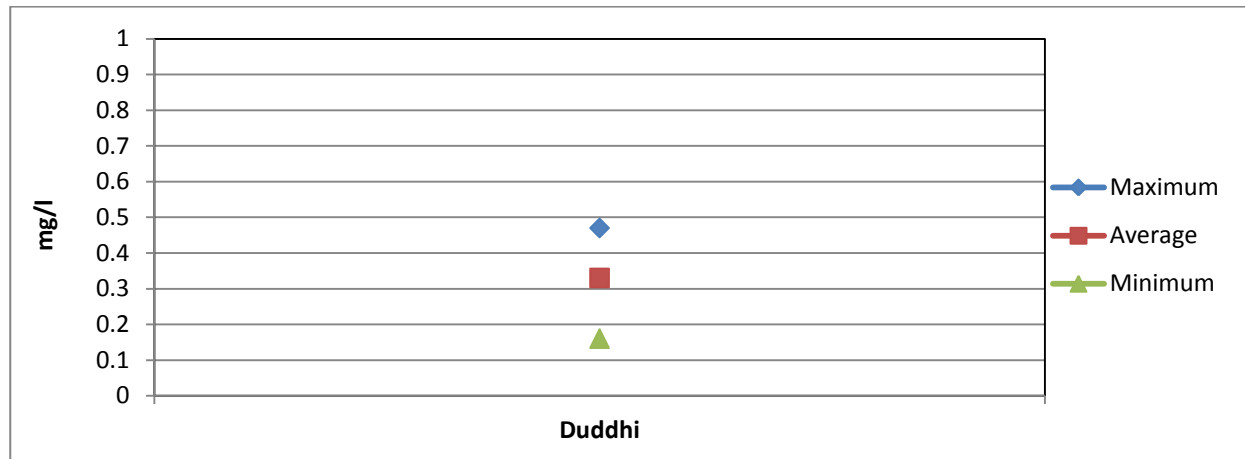
**Parameter : DO current year**



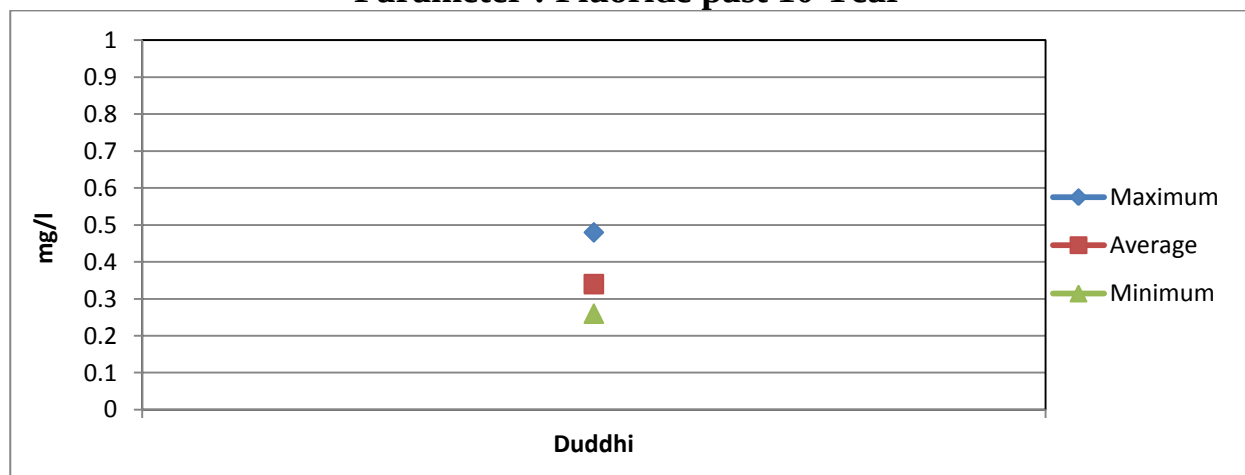
#### 4.3.3 Fluoride in mg/l

| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                    |                 | Avg. of Yearly Minimum |                    |                 | Annual Average             |            |             |
|-----------------------------------|------------------------|--------------------|-----------------|------------------------|--------------------|-----------------|----------------------------|------------|-------------|
|                                   | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception<br>from | 10<br>year | One<br>year |
| Site 1 Duddhi                     | 0.47                   | 0.48               | 0.34            | 0.16                   | 0.26               | 0.20            | 0.33                       | 0.34       | 0.25        |

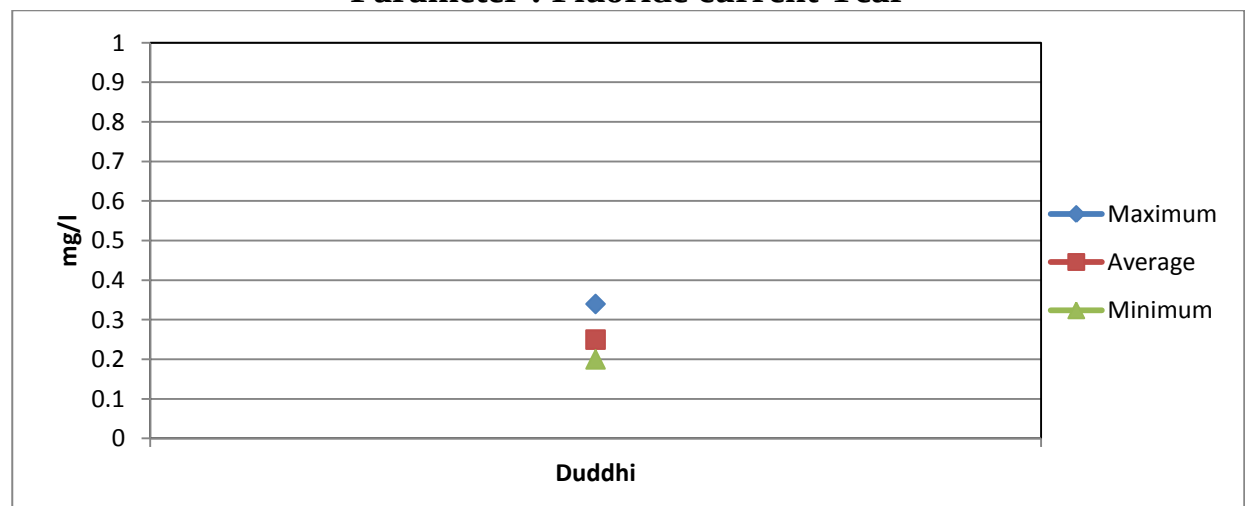
### Parameter : Fluoride since inception



### Parameter : Fluoride past 10 Year



### Parameter : Fluoride current Year

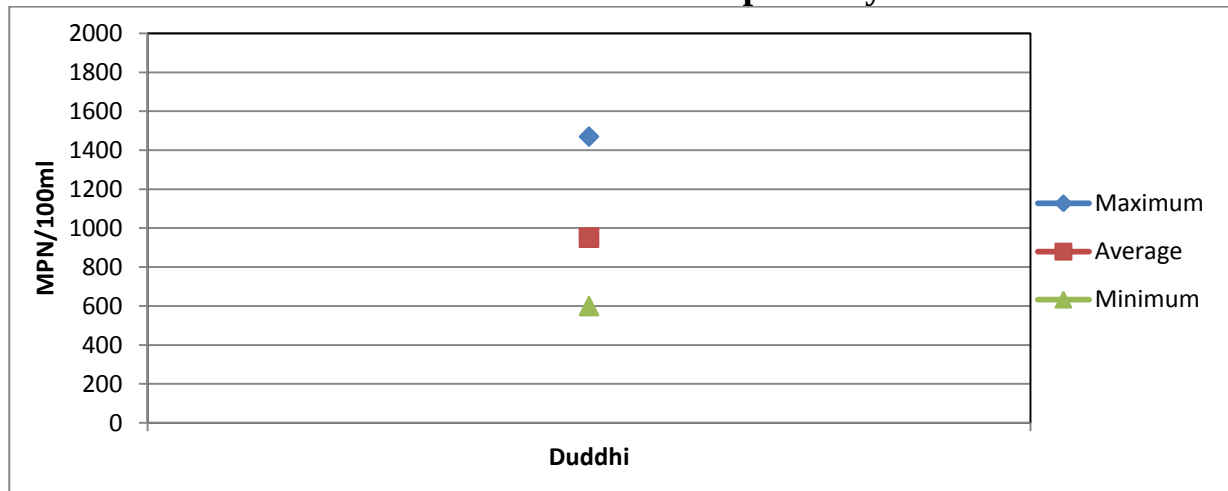


#### 4.3.4 Total coliform in MPN/100ml

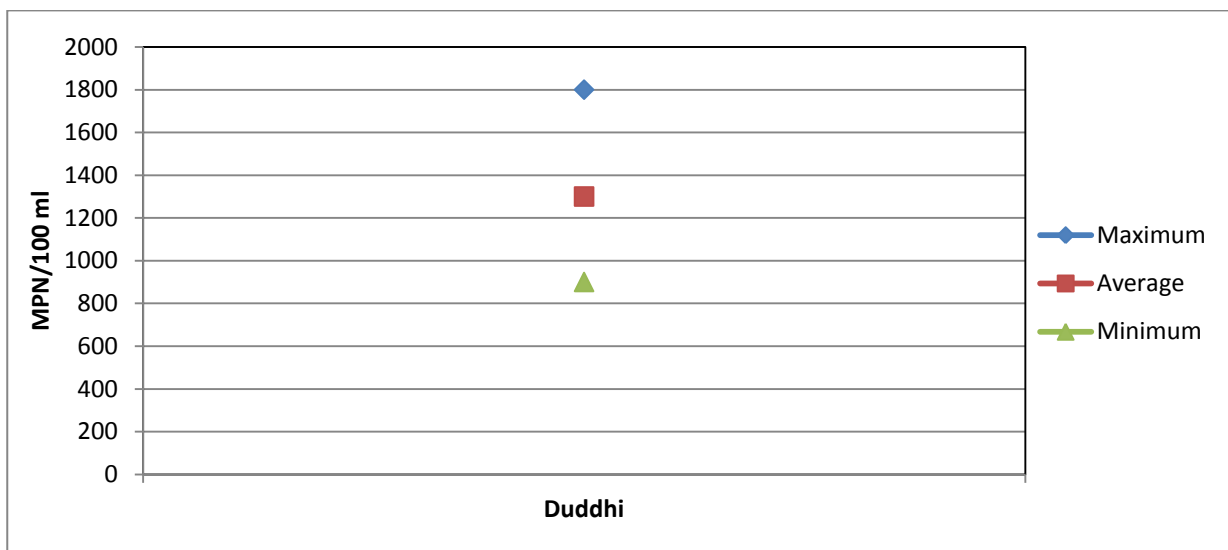
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                    |                 | Avg. of Yearly Minimum |                    |                 | Annual Average     |                    |                 |
|-----------------------------------|------------------------|--------------------|-----------------|------------------------|--------------------|-----------------|--------------------|--------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception     | Past<br>10<br>year | Current<br>year | Since<br>inception | Past<br>10<br>year | Current<br>year |
| Site 1 Duddhi                     | -                      | 1470               | 1800            | -                      | 600                | 900             | -                  | 951                | 1300            |

**Note :** Total coliform started from May 2007 at Duddhi.

#### Parameter : Total coliform past 10 year



#### Parameter : Total coliform current year

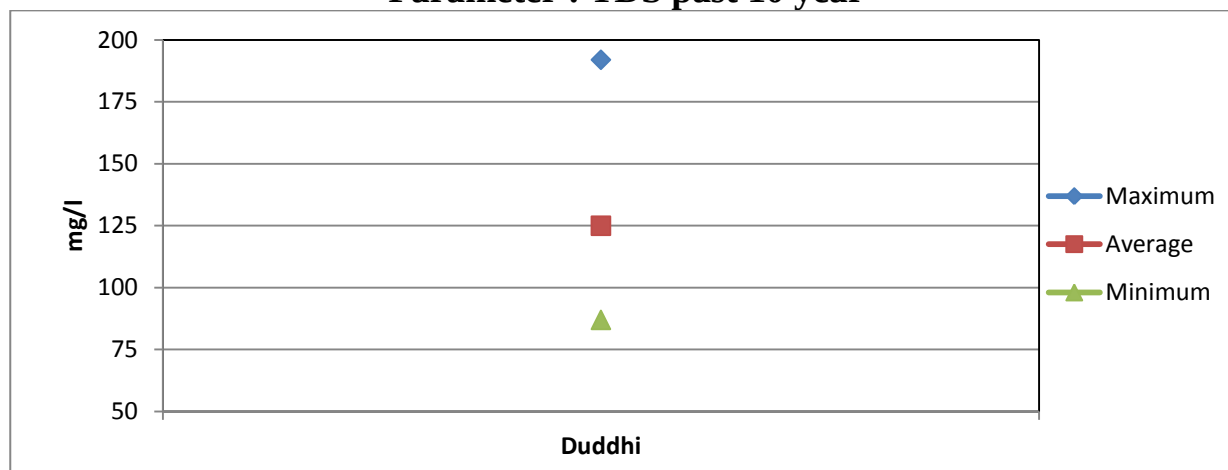


#### 4.3.5 Total Dissolved Solids (TDS) in mg/l

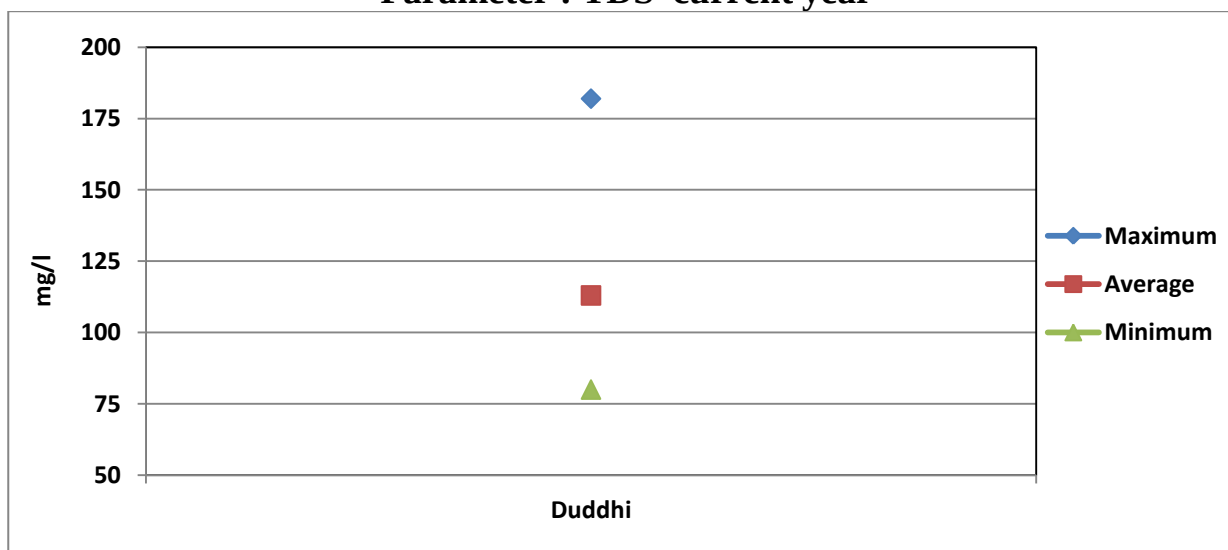
| Site Name<br>(From U/S to<br>D/S) | Avg. of Yearly Maximum |                     |                 | Avg. of Yearly Minimum |                     |                 | Annual Average     |                     |                 |
|-----------------------------------|------------------------|---------------------|-----------------|------------------------|---------------------|-----------------|--------------------|---------------------|-----------------|
|                                   | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception     | Past<br>10<br>year* | Current<br>year | Since<br>inception | Past<br>10<br>year* | Current<br>year |
| Site 1 Duddhi                     | -                      | 192                 | 182             | -                      | 87                  | 80              | -                  | 125                 | 113             |

\*TDS started from June 2009 at Duddhi.

**Parameter : TDS past 10 year**

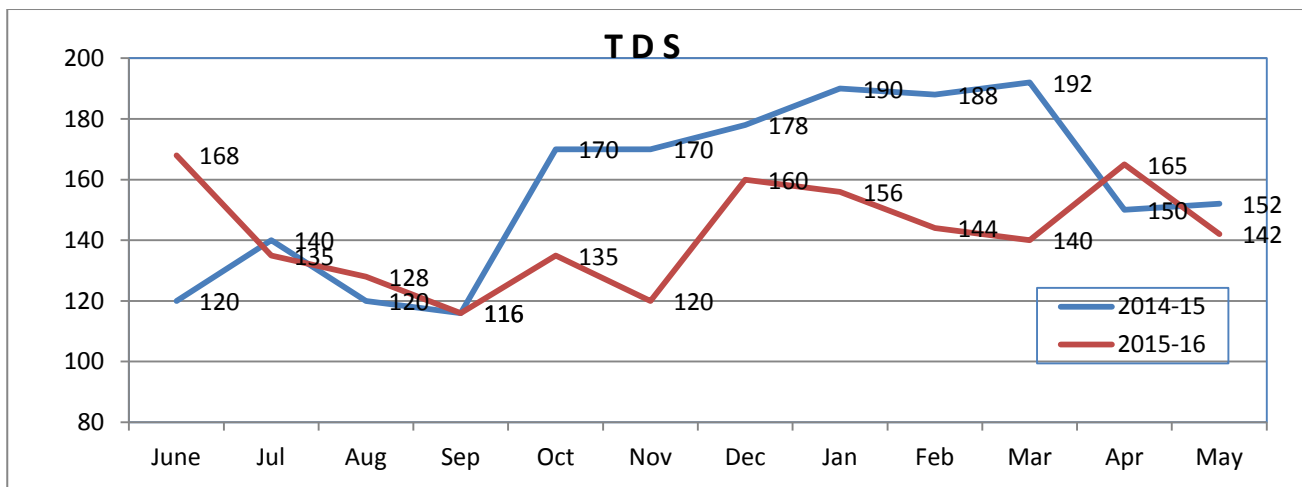
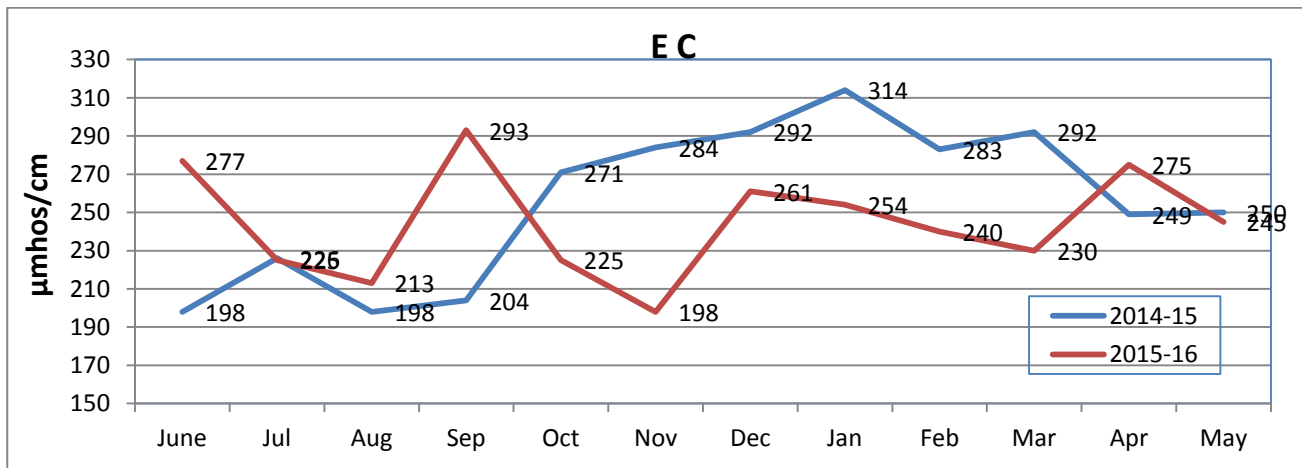
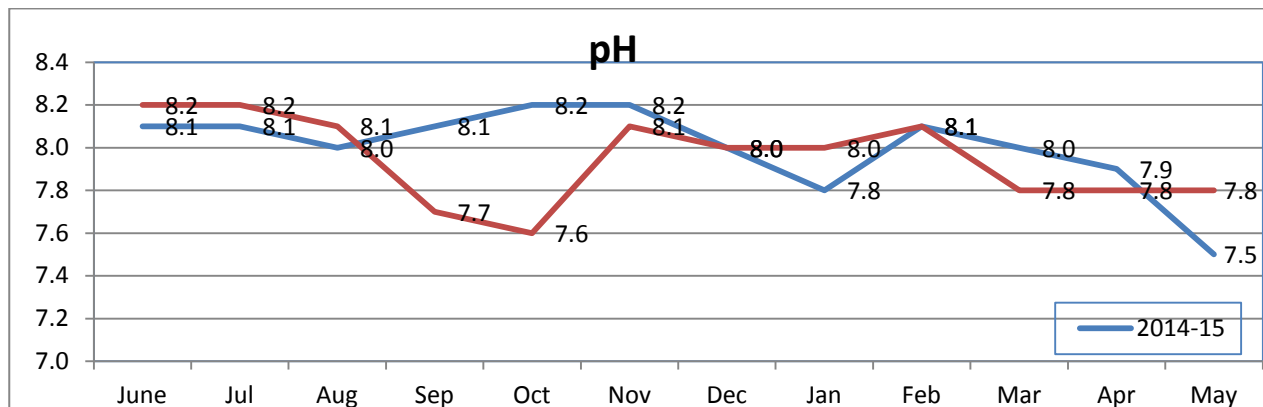


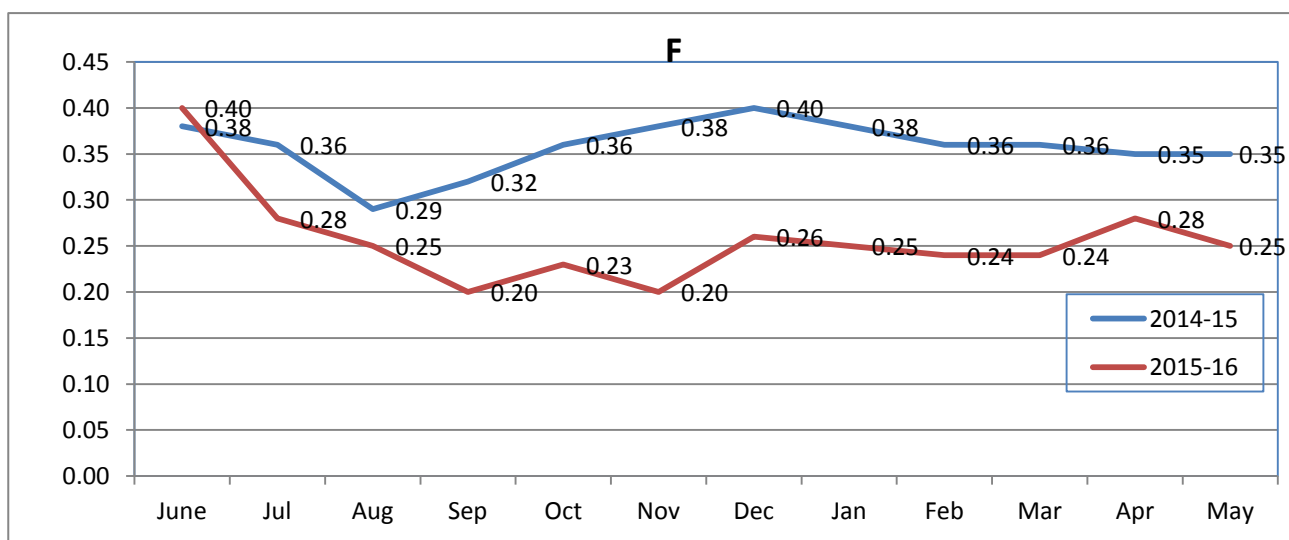
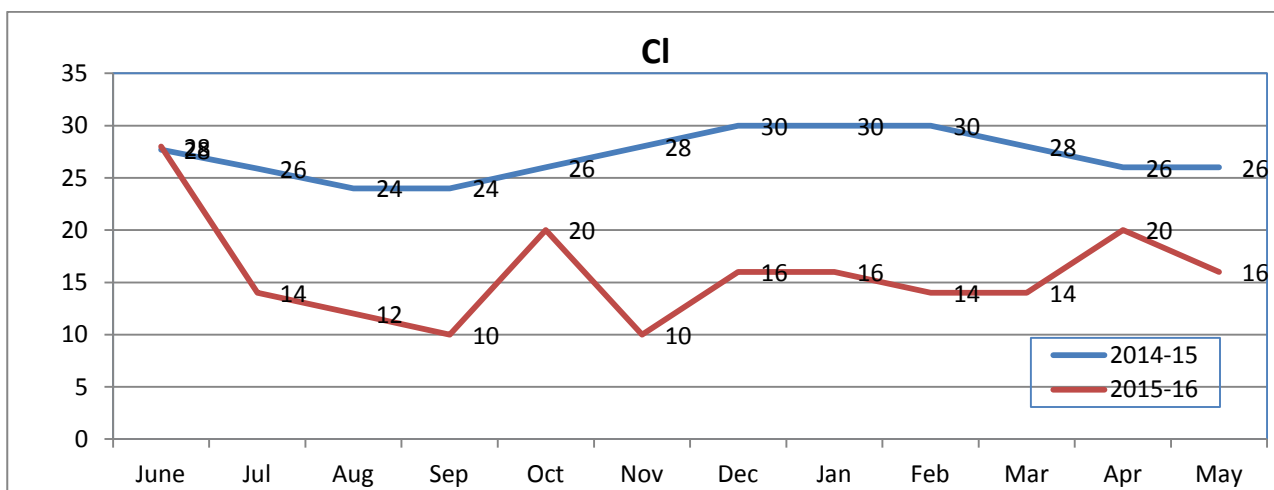
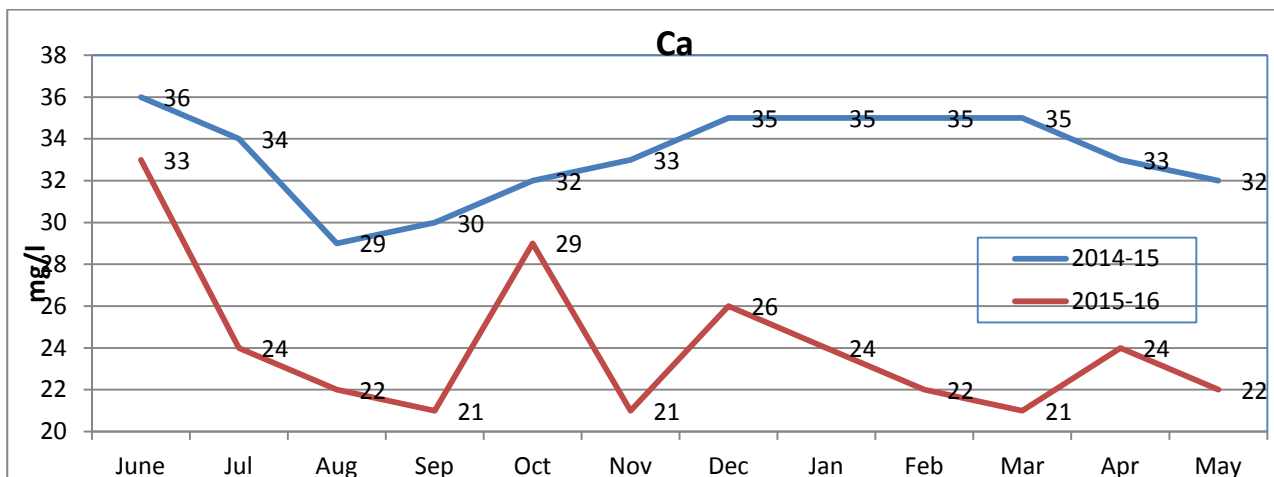
**Parameter : TDS current year**

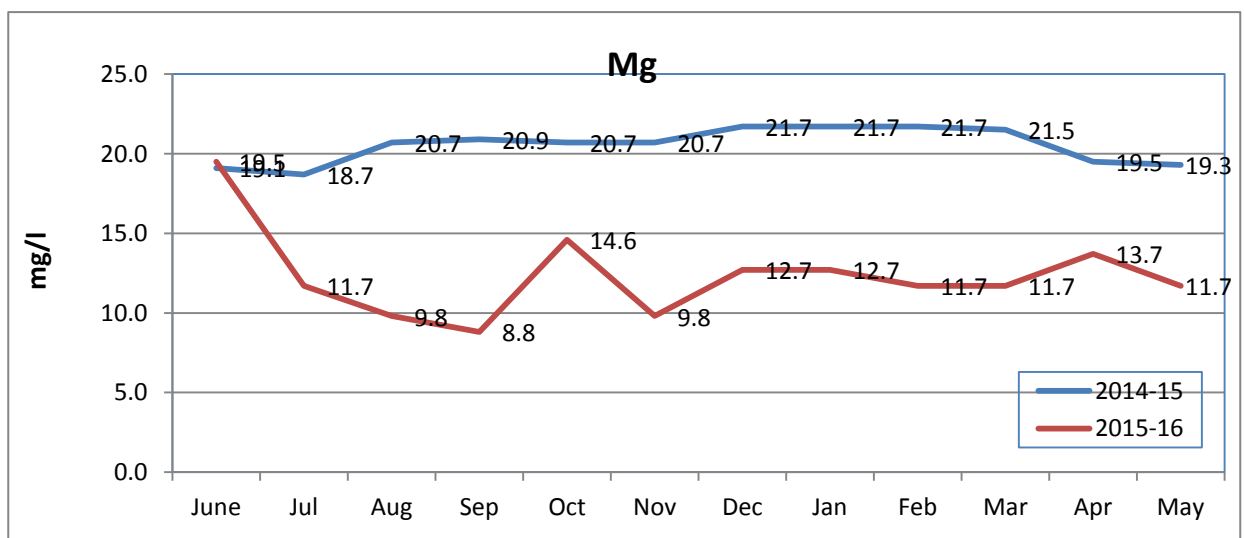
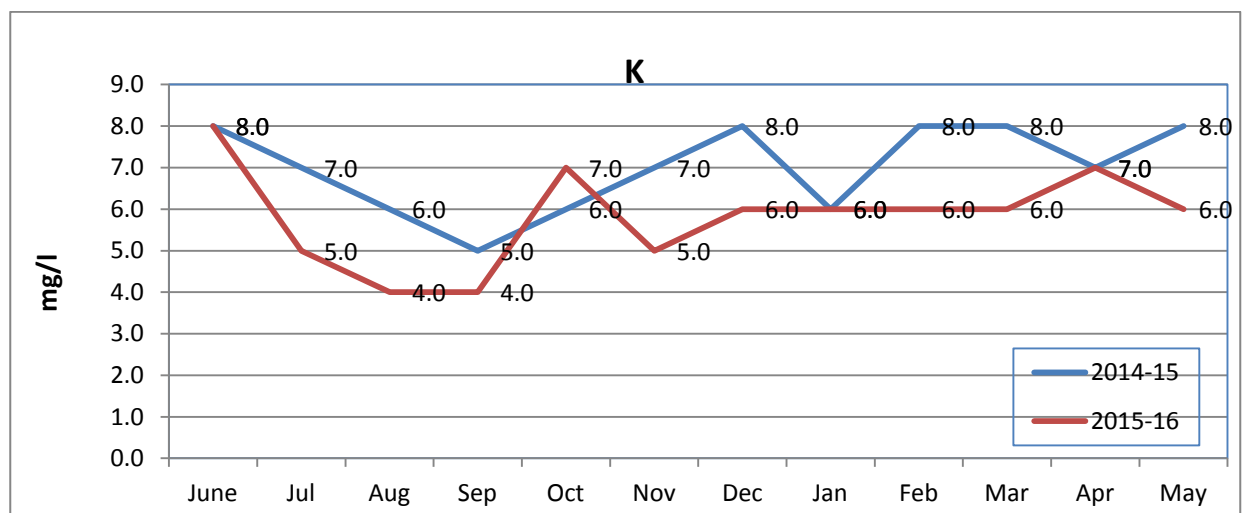
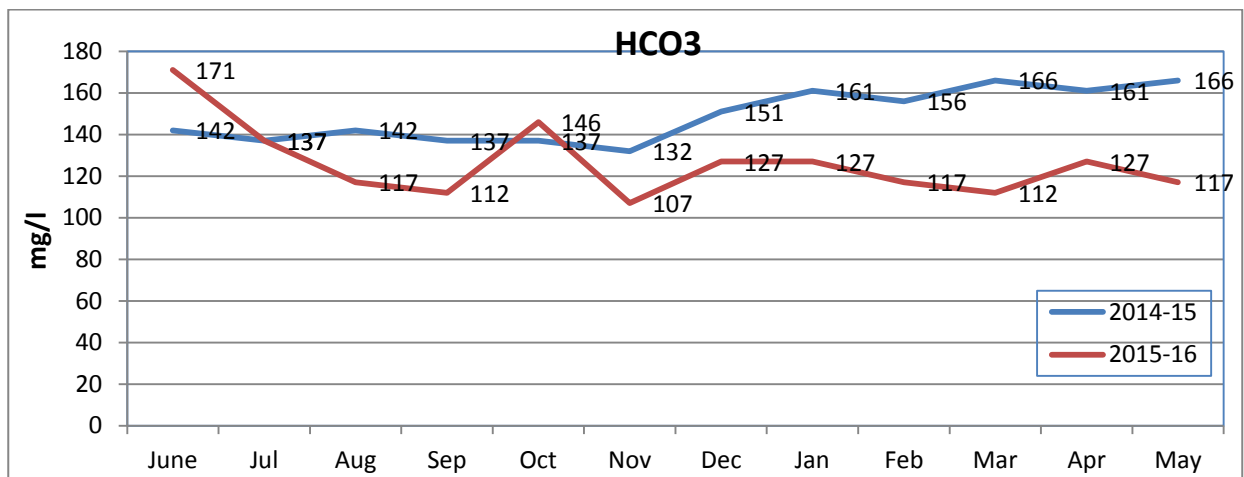


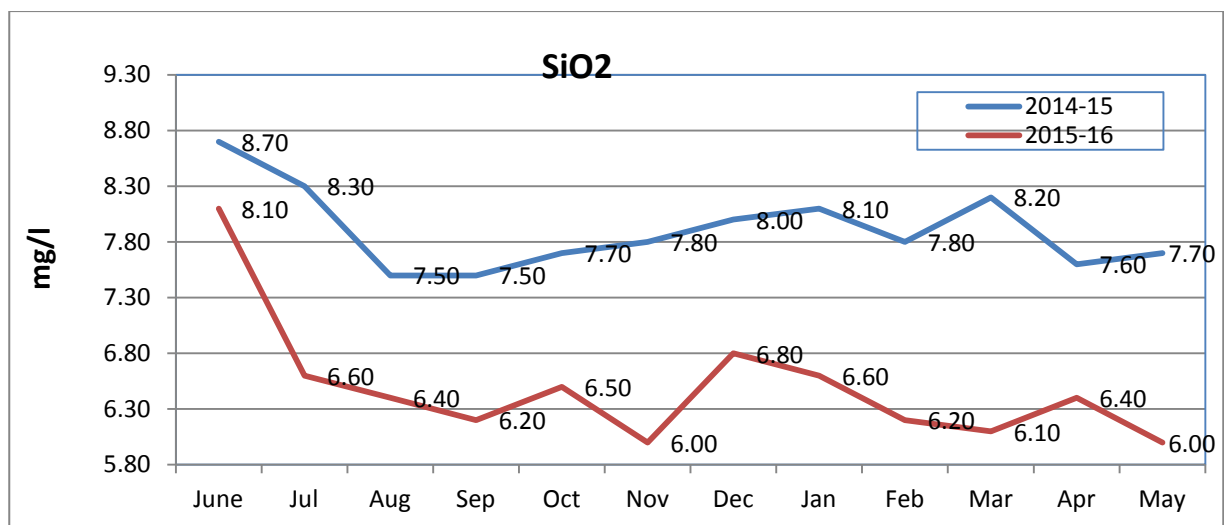
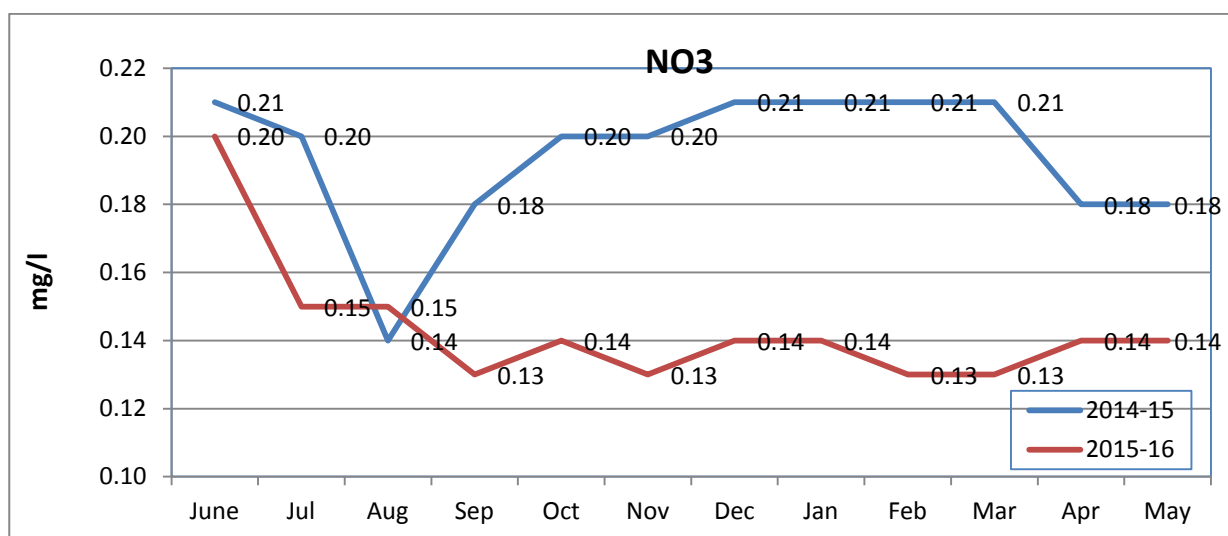
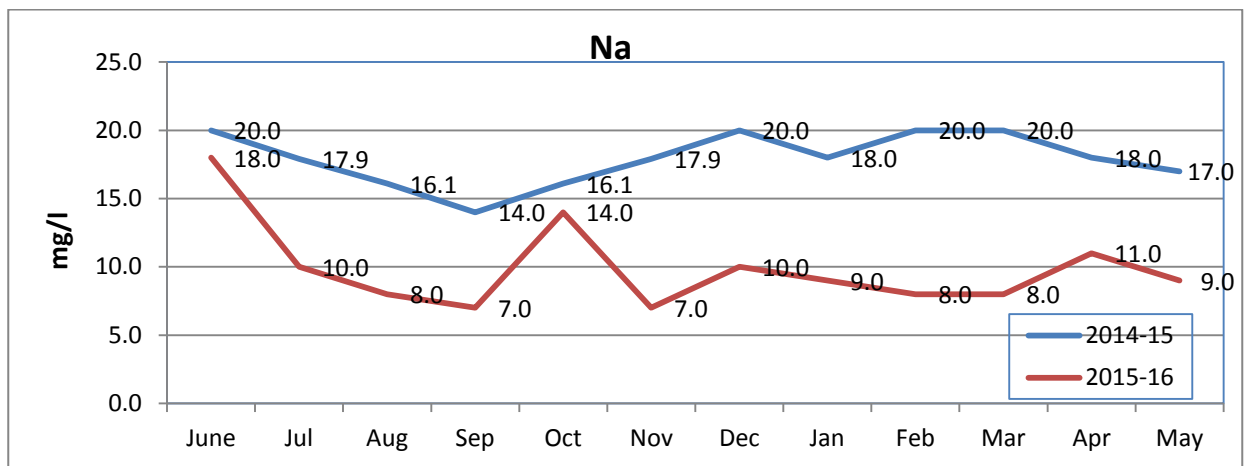
#### 4.4. COMPARISON OF WATER QUALITY PARAMETERS DURING THE WATER YEAR 2014-2015 AND 2015-16 :

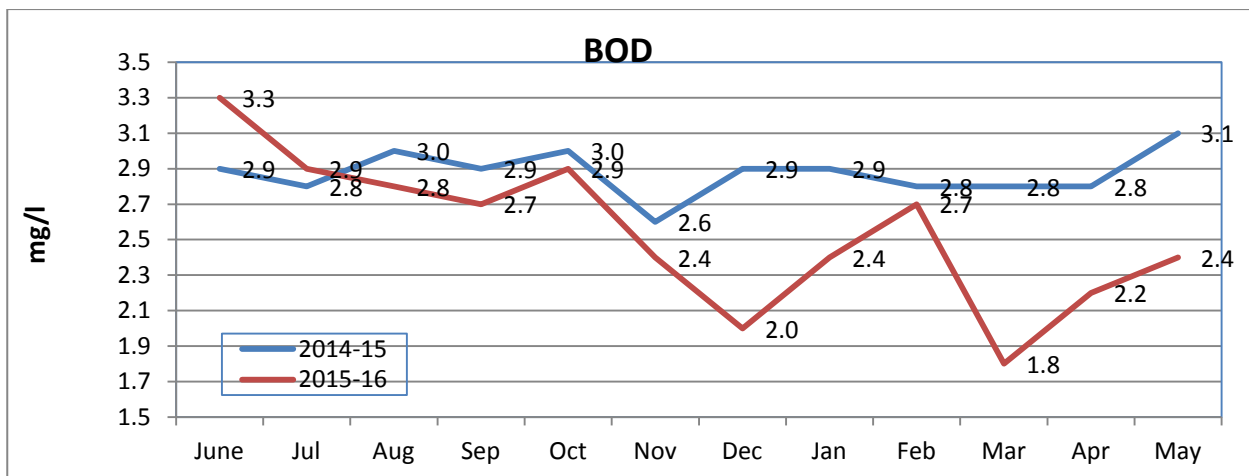
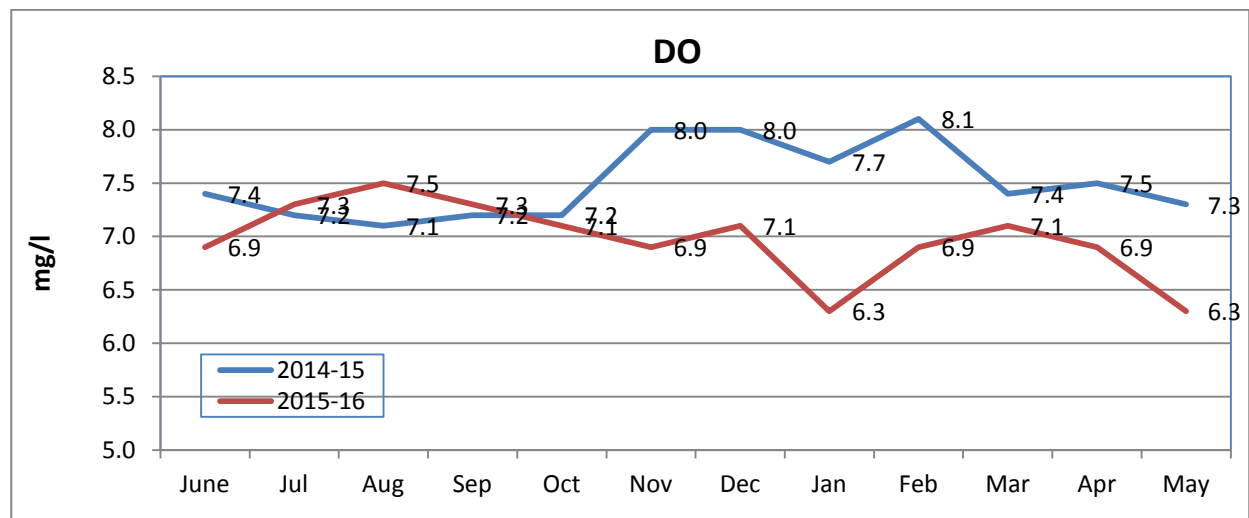
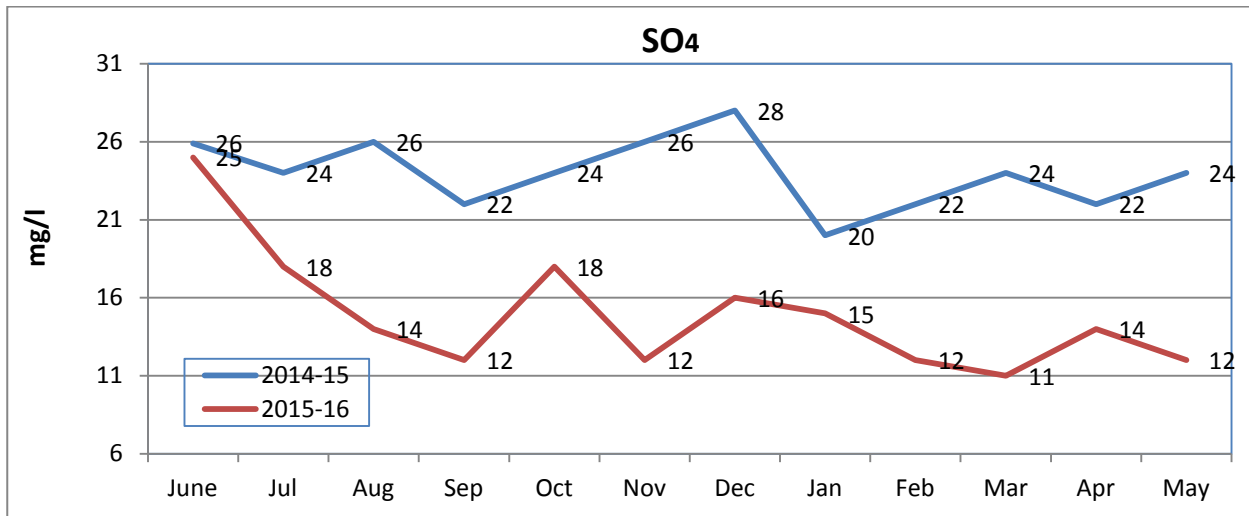
##### 4.4.1 Kuldah Bridge- River Sone

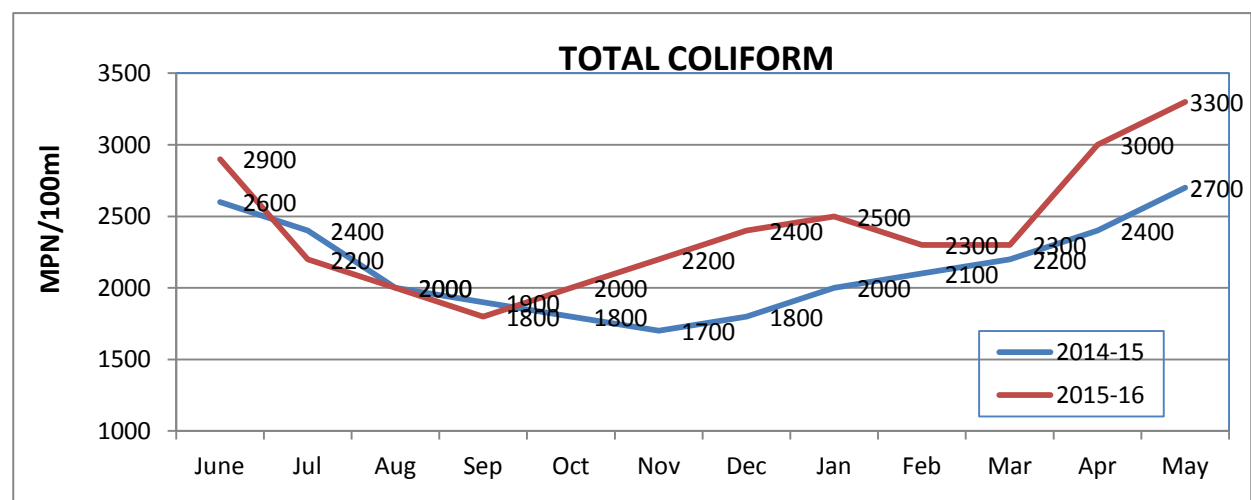
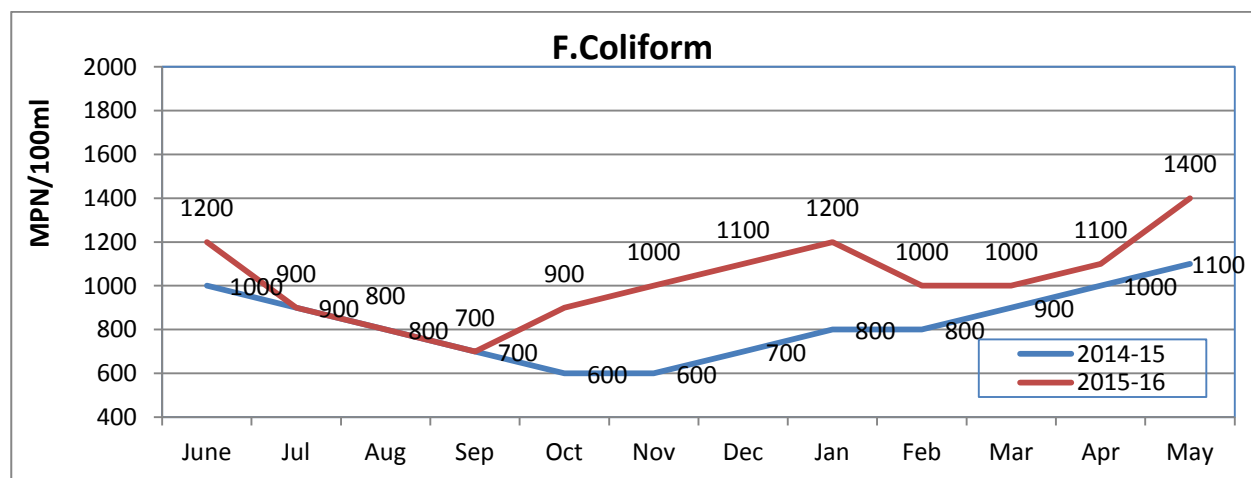
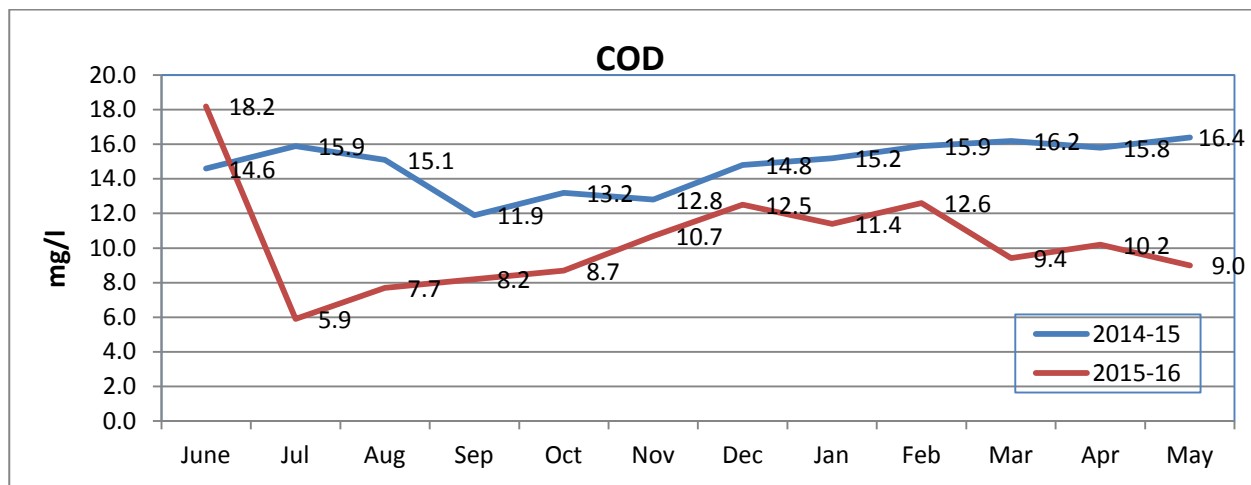


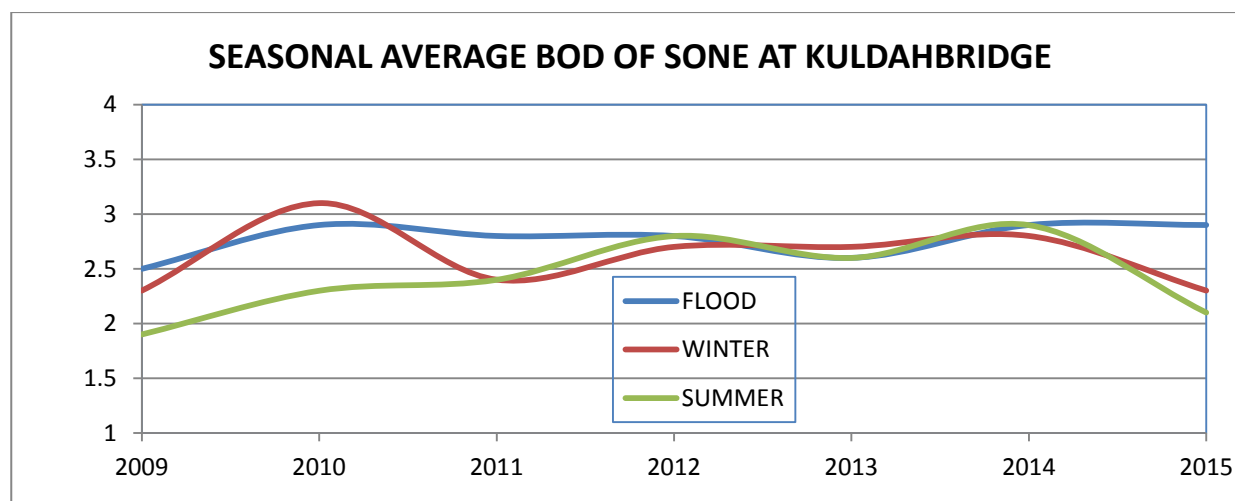
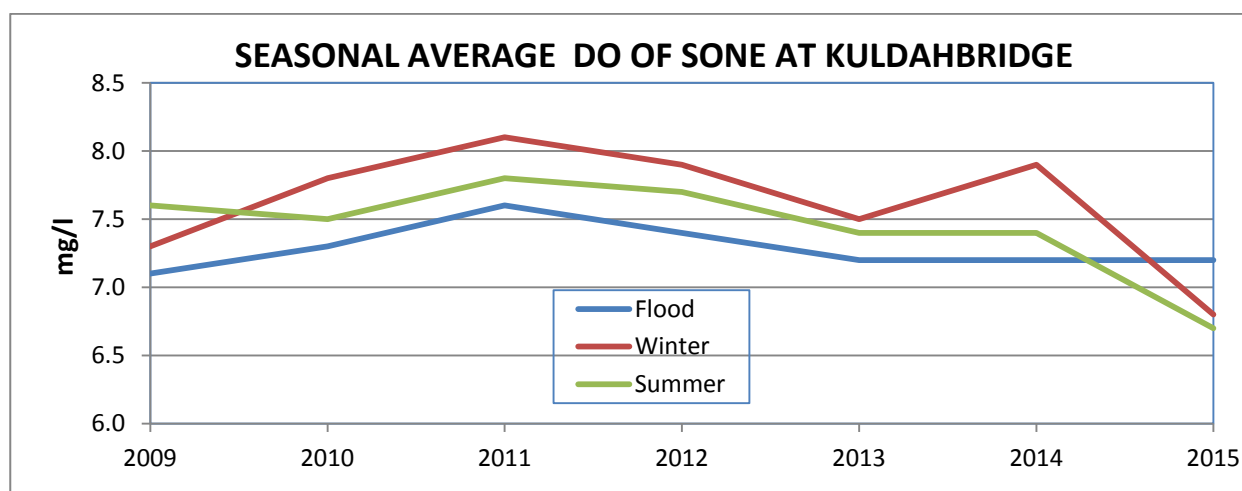
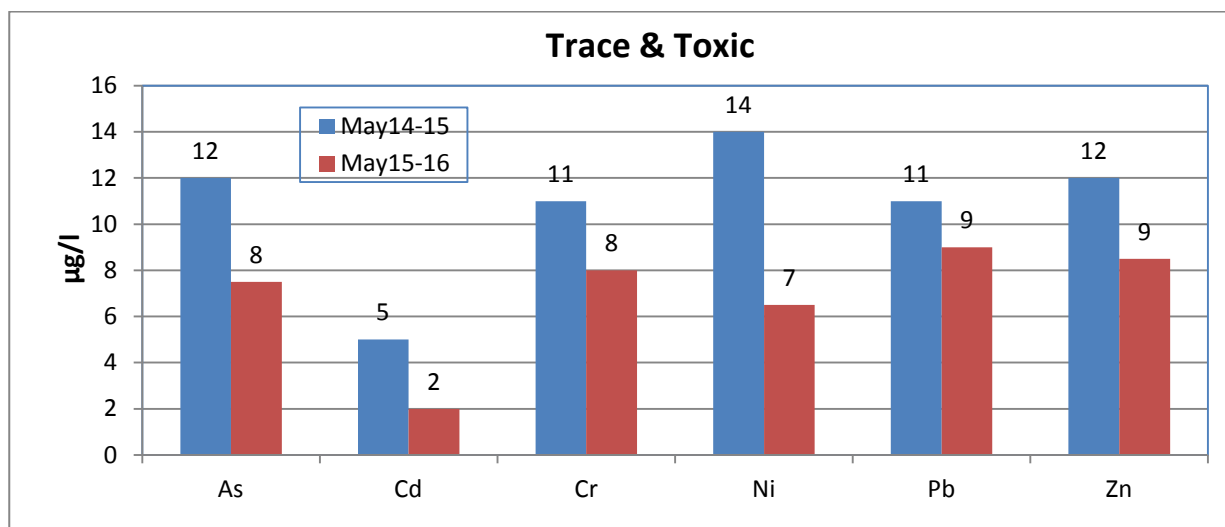




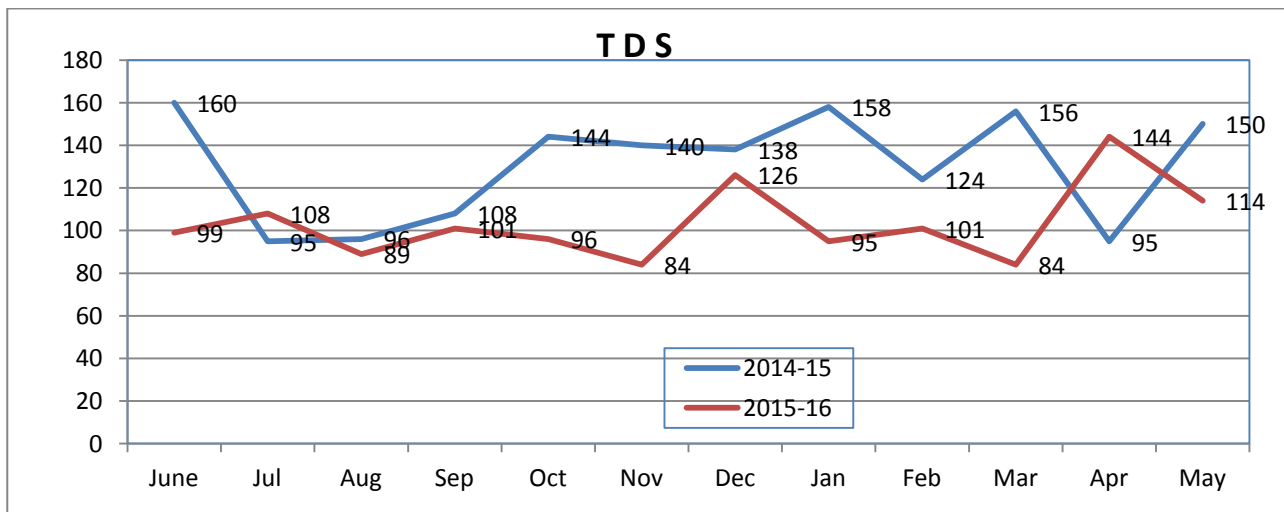
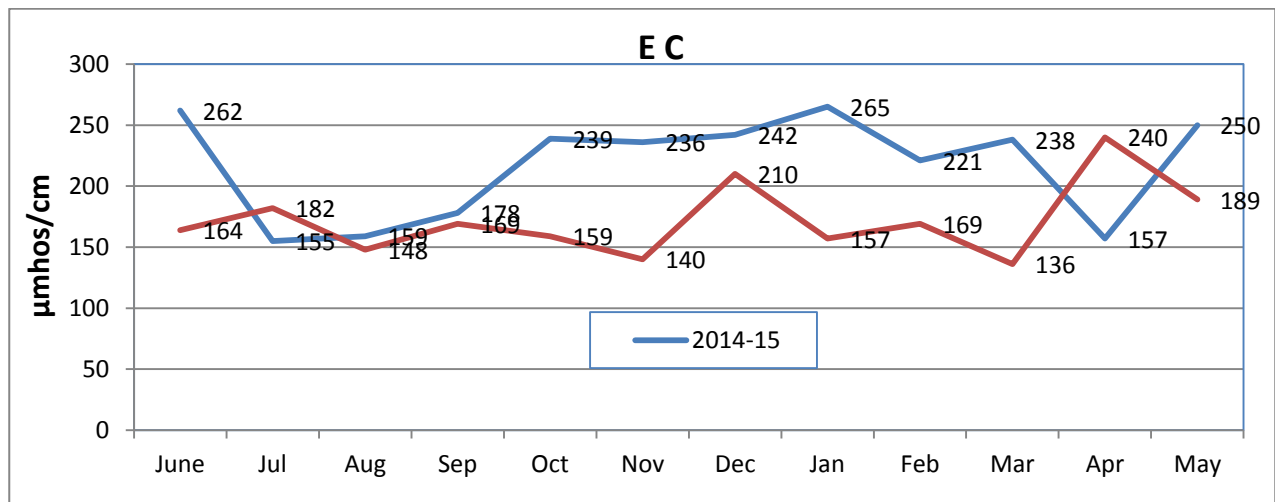
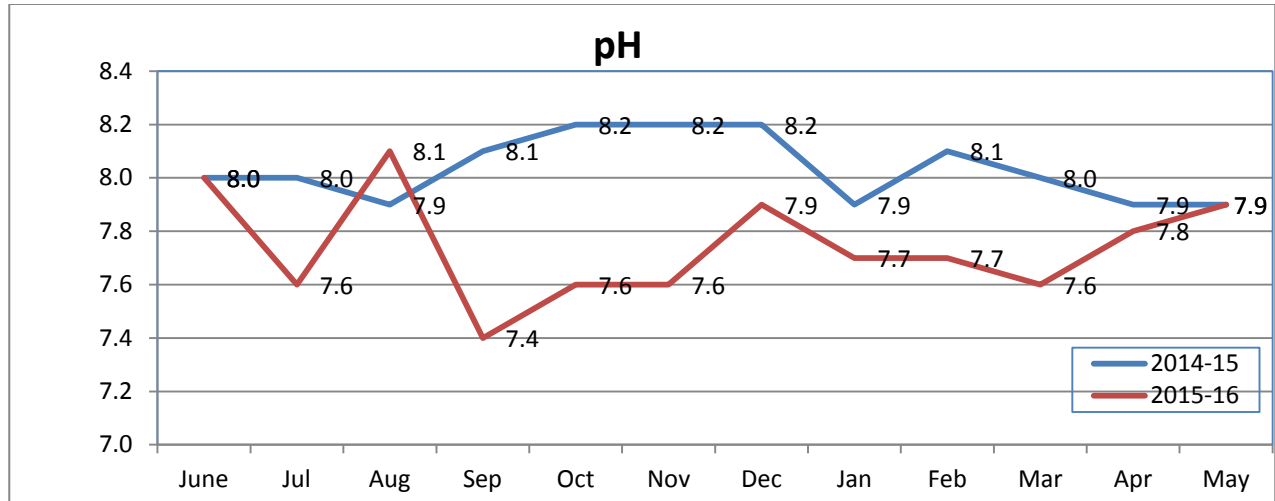


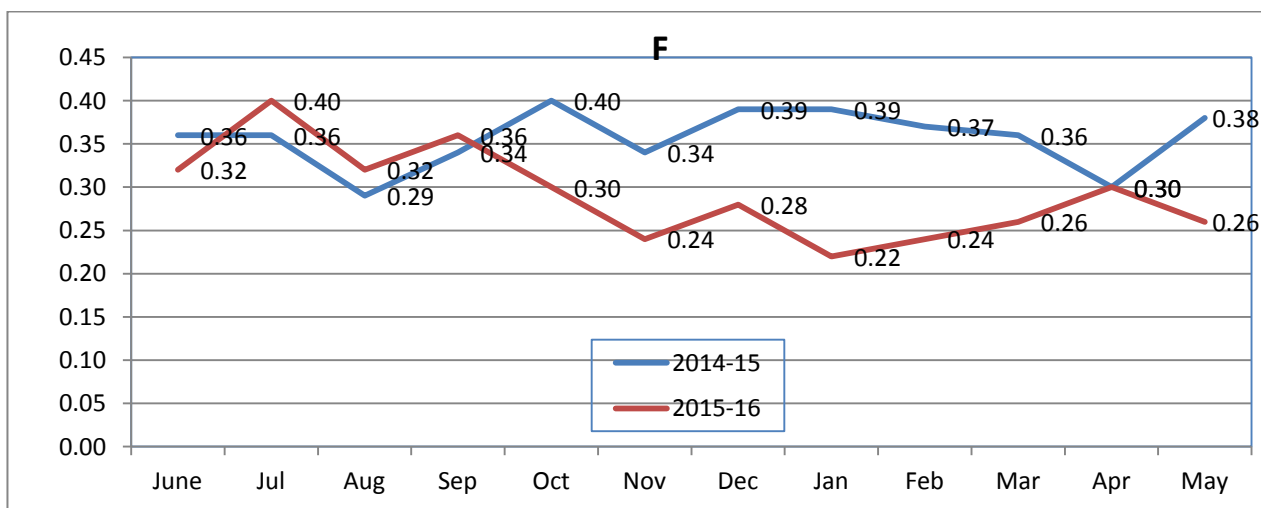
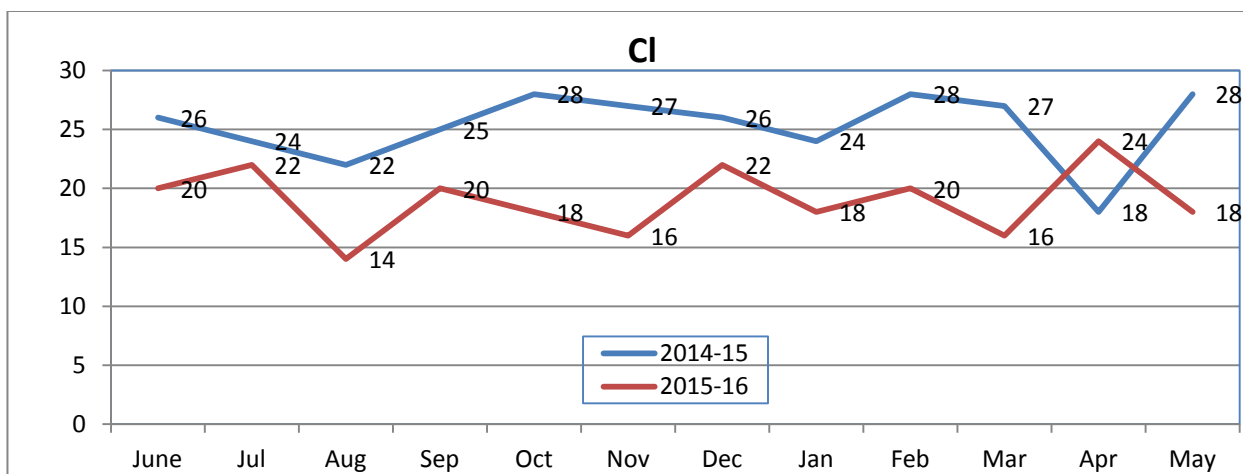
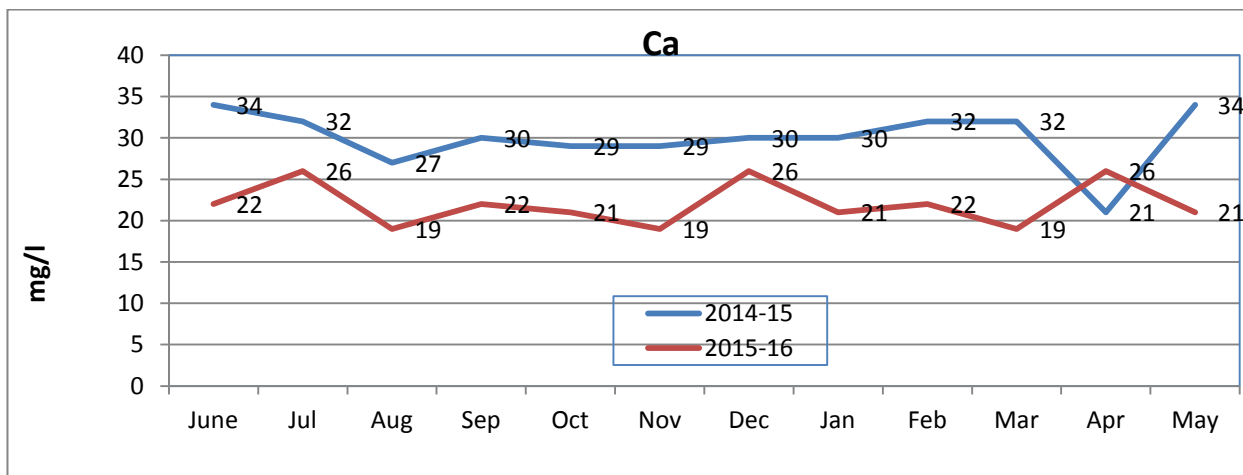


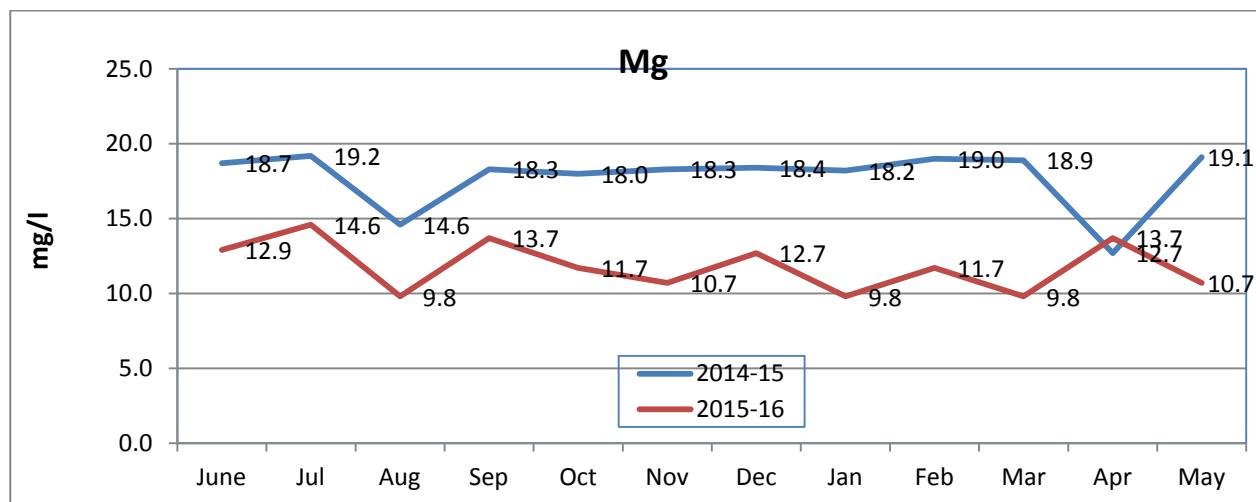
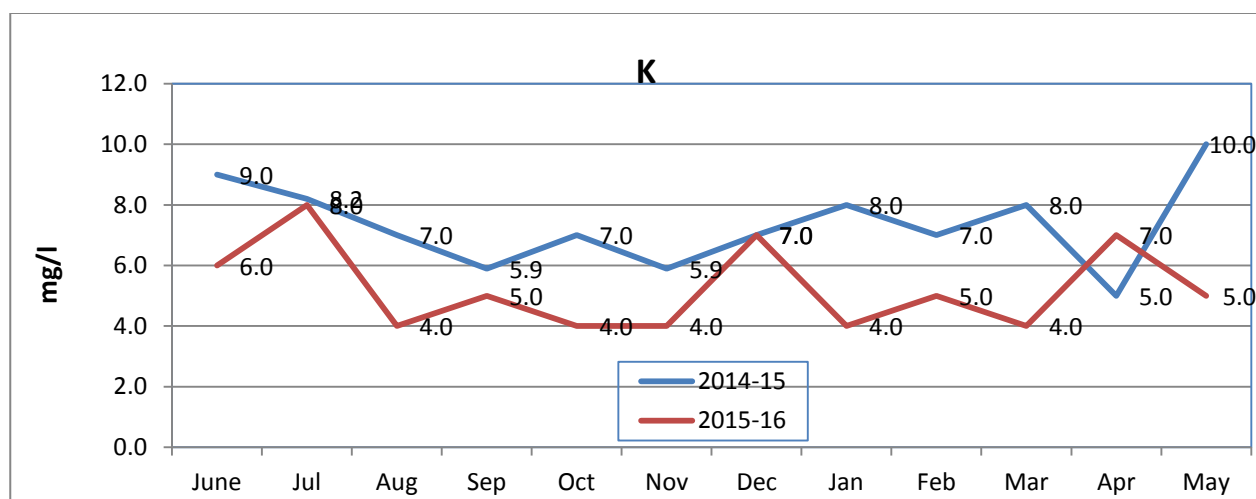
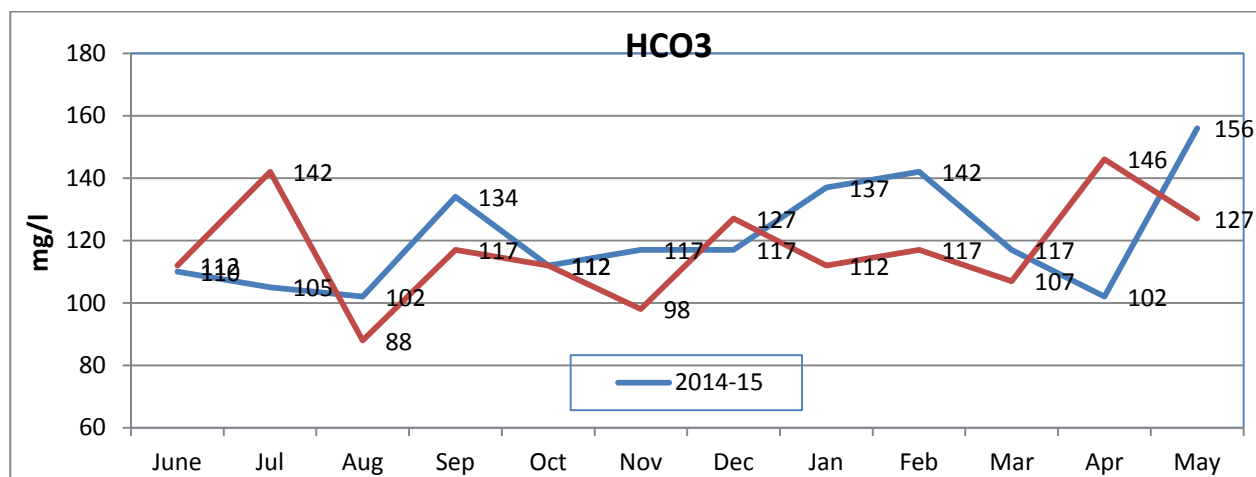


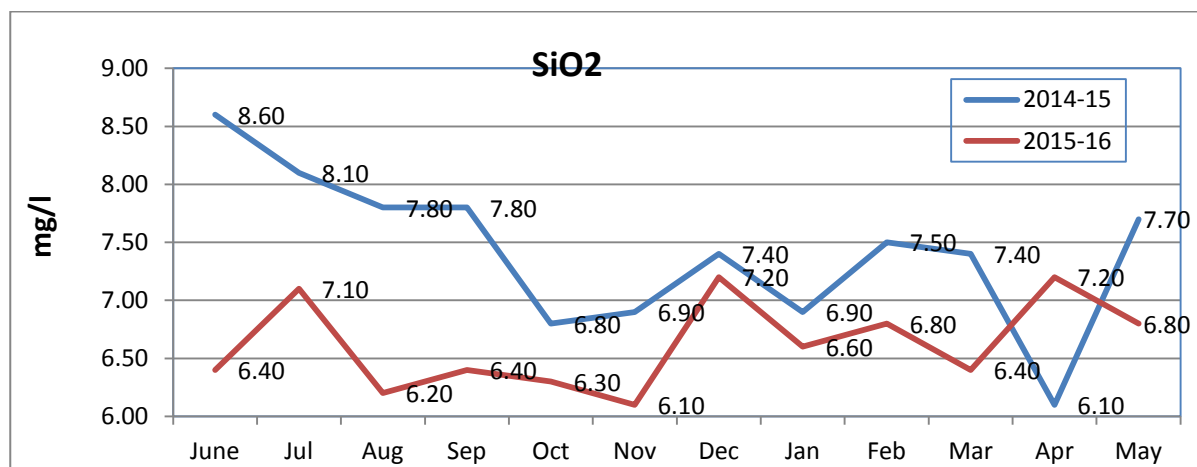
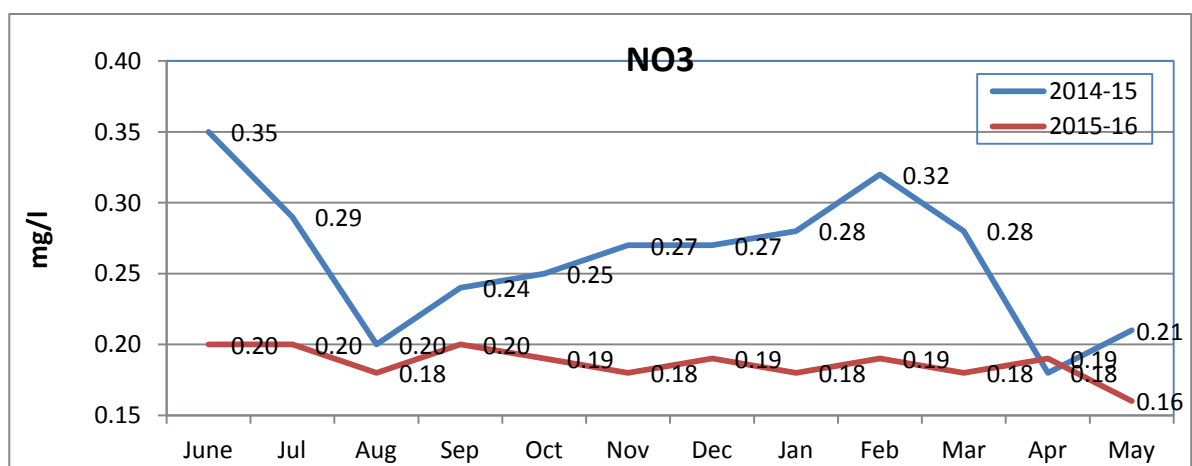
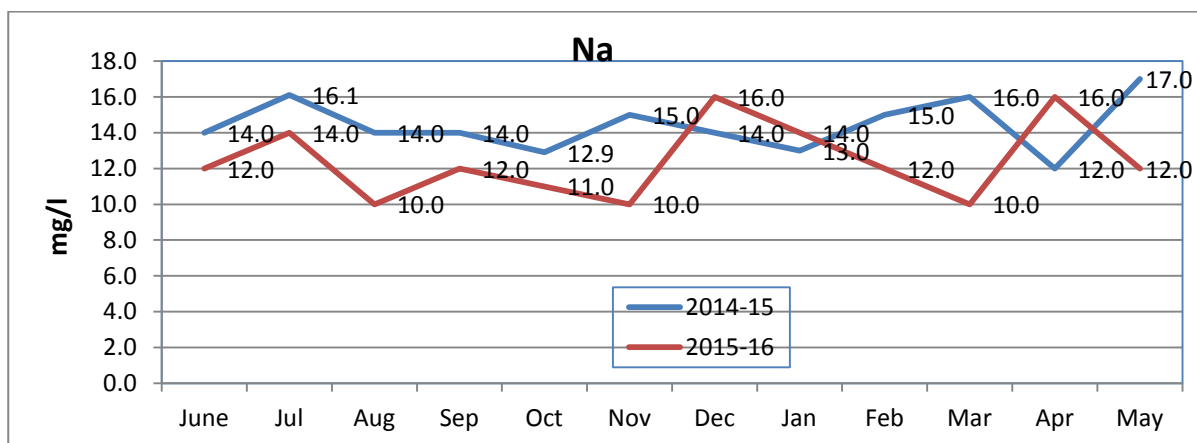


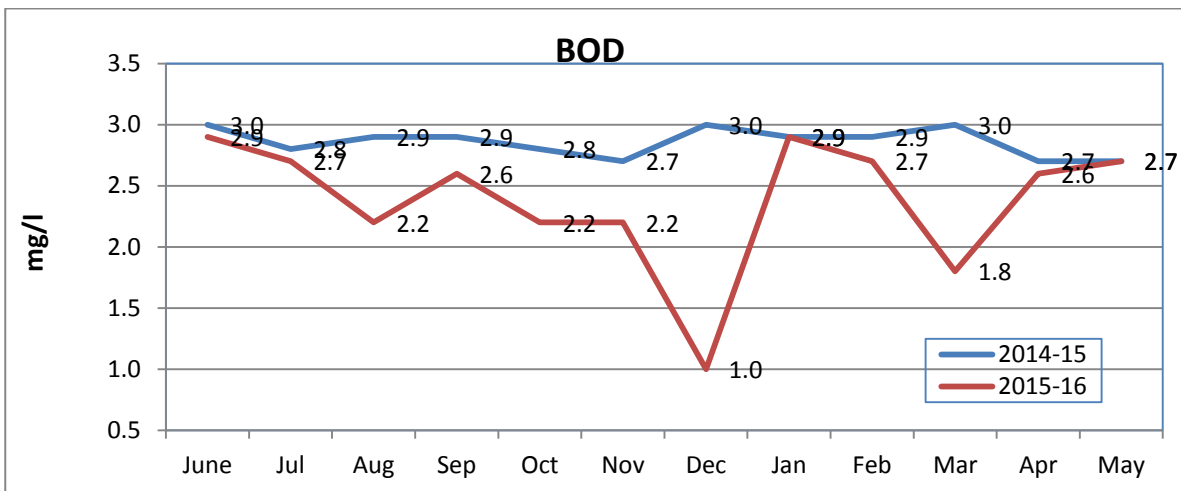
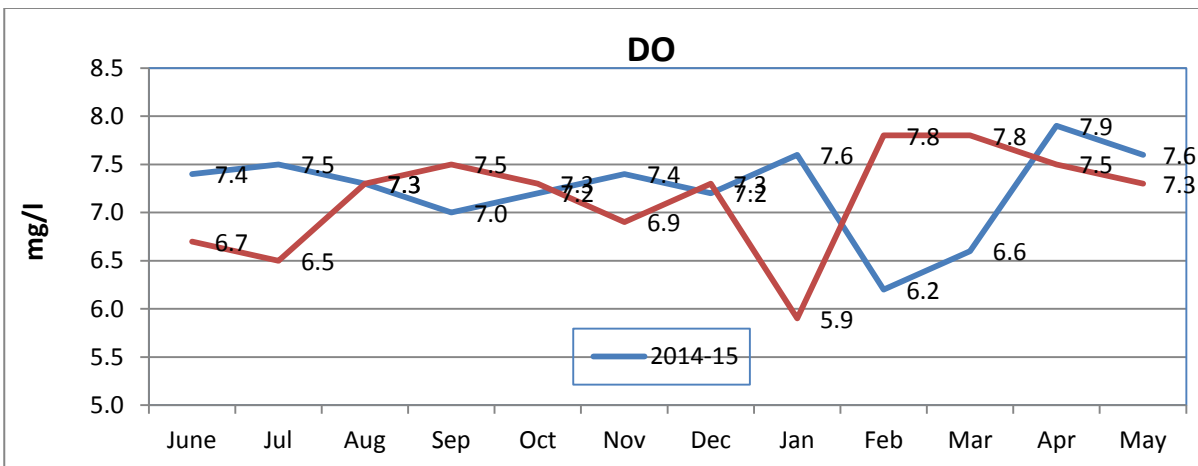
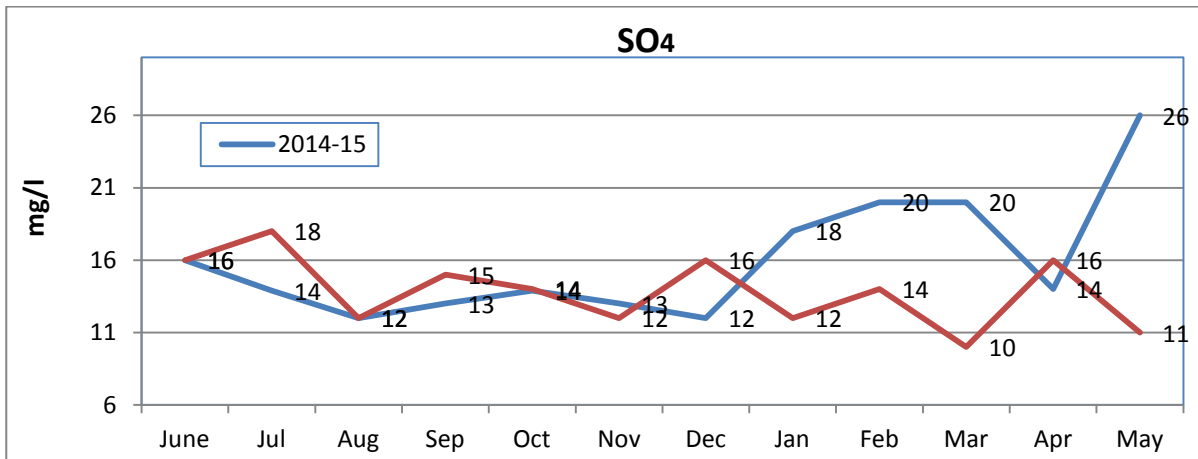
#### 4.4.2 Chopan- River Sone

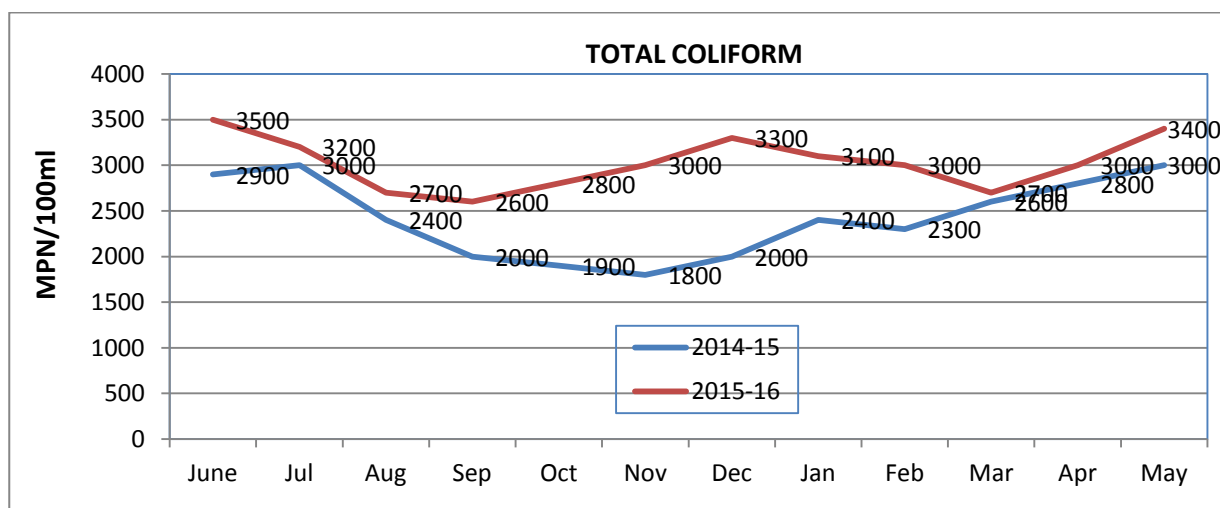
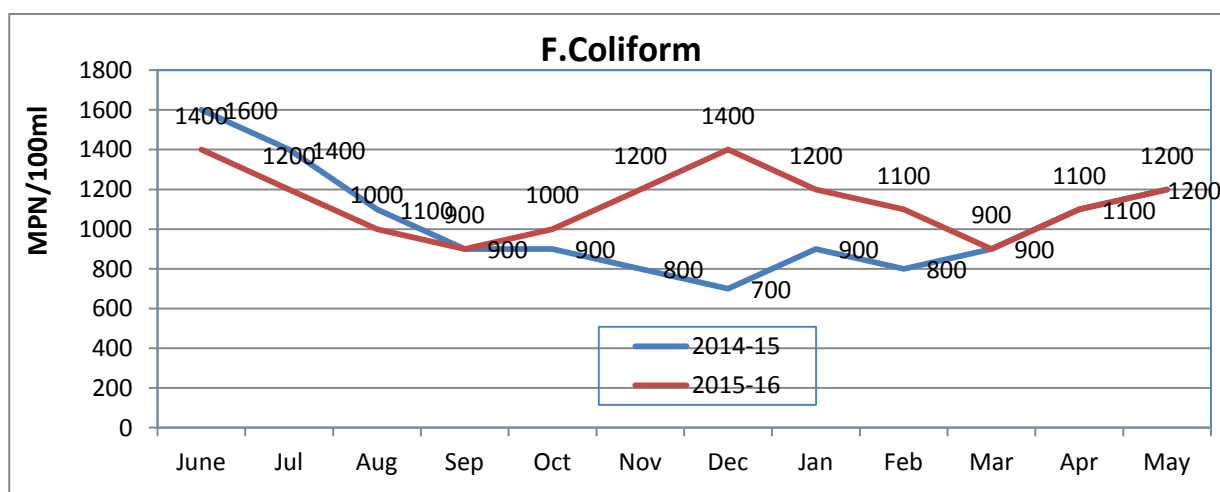
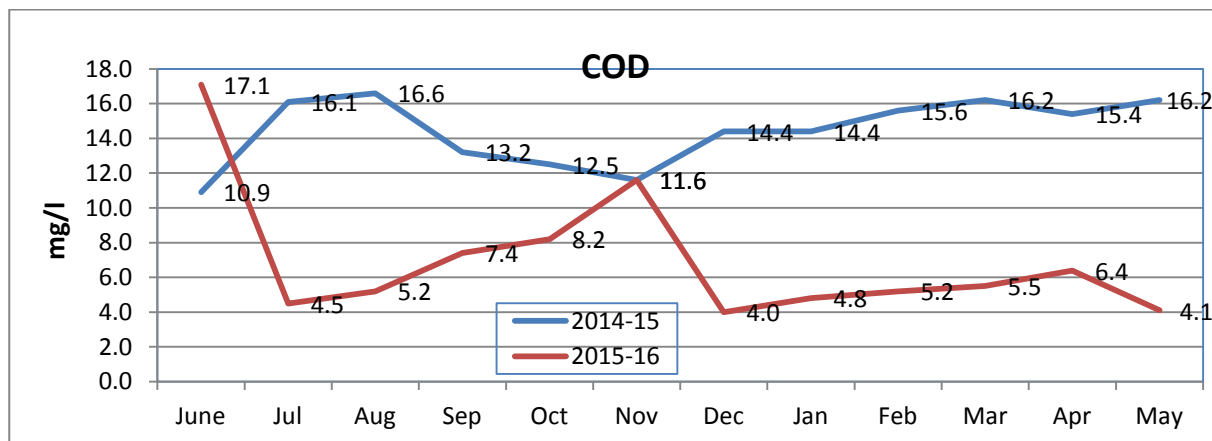


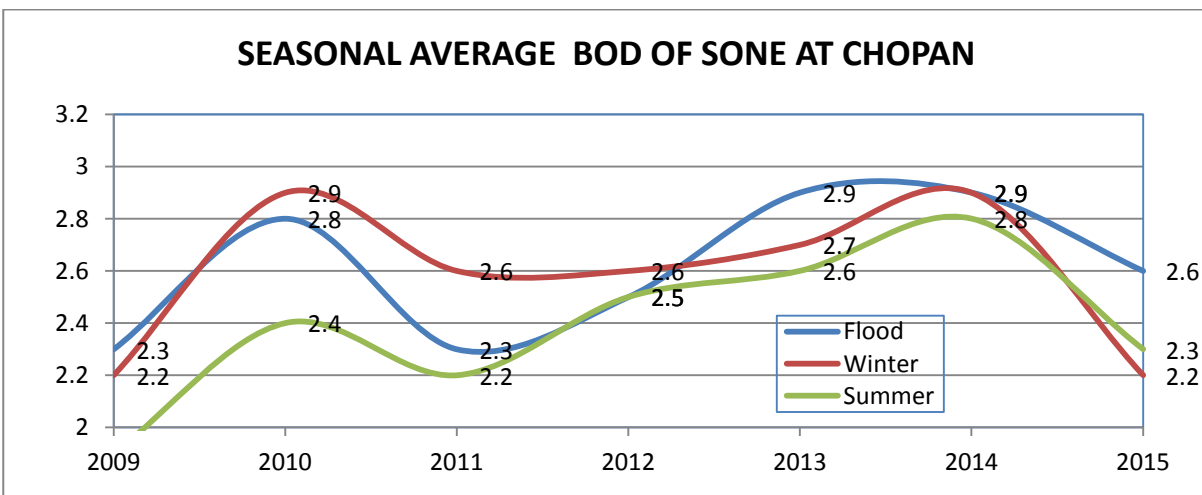
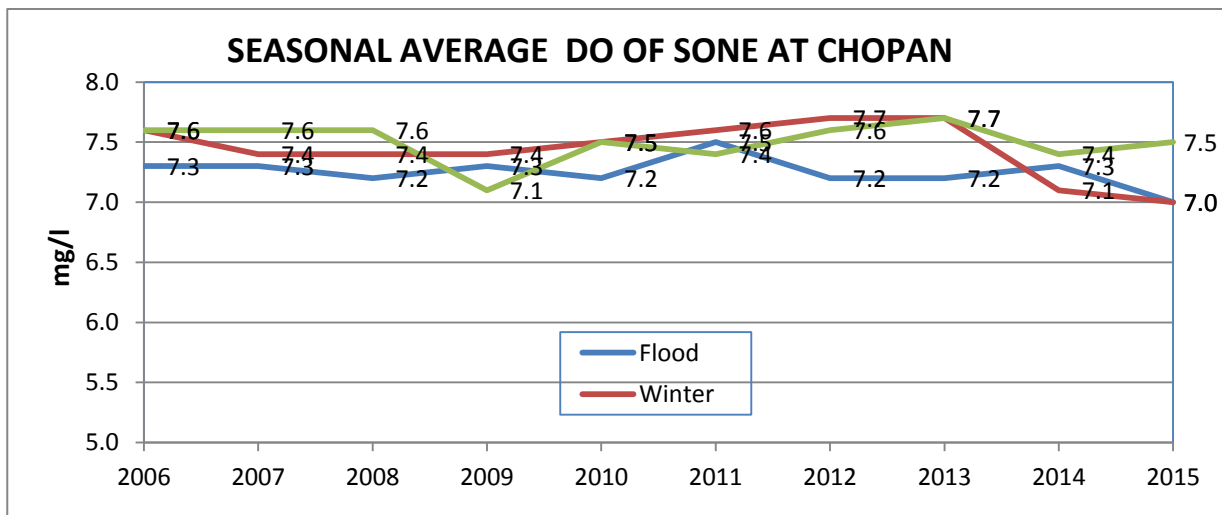
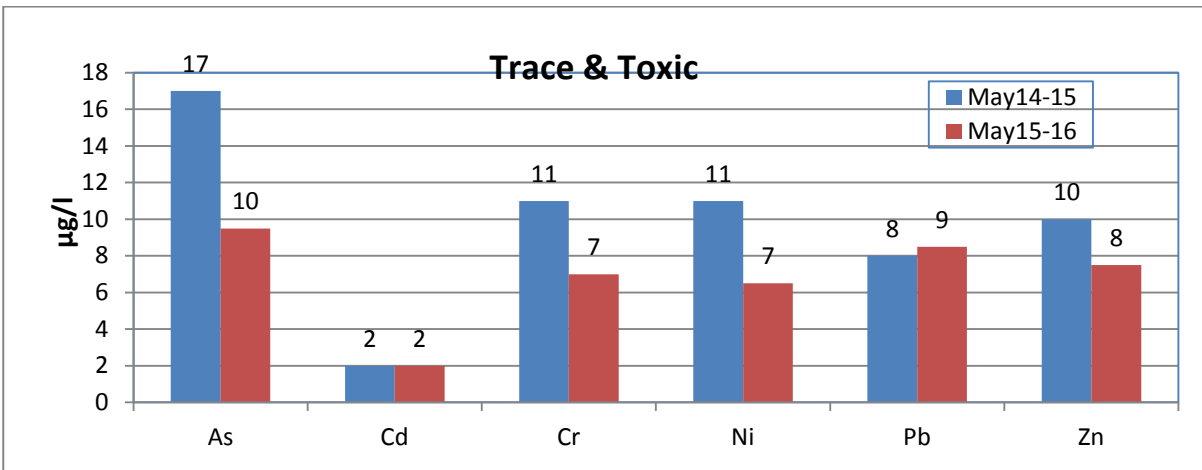




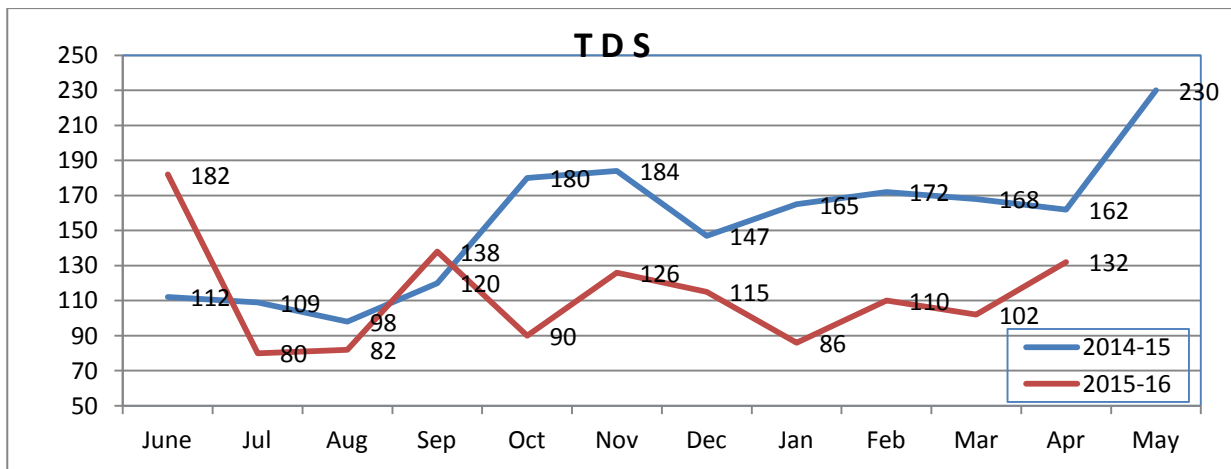
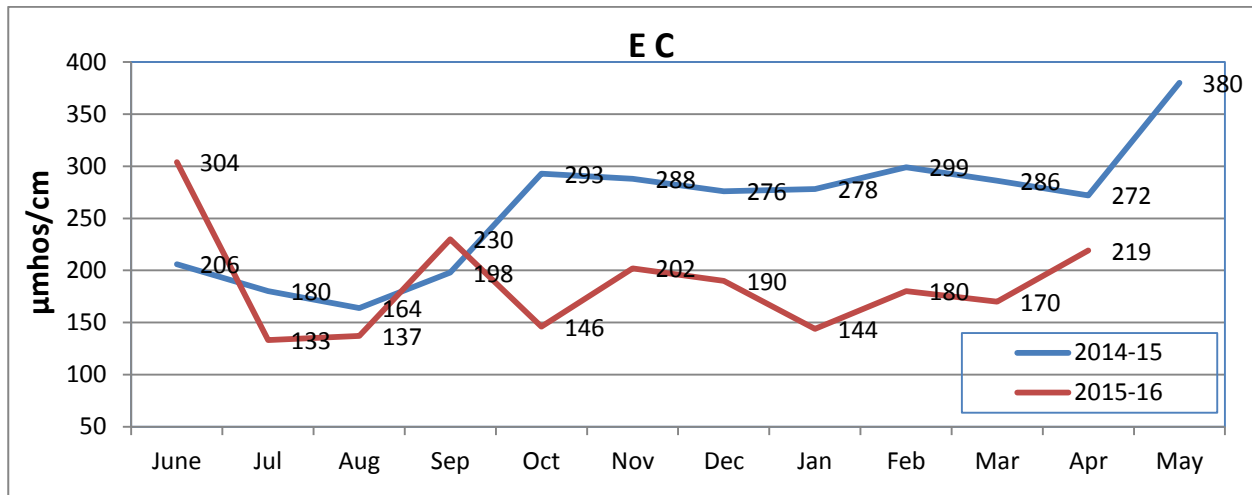
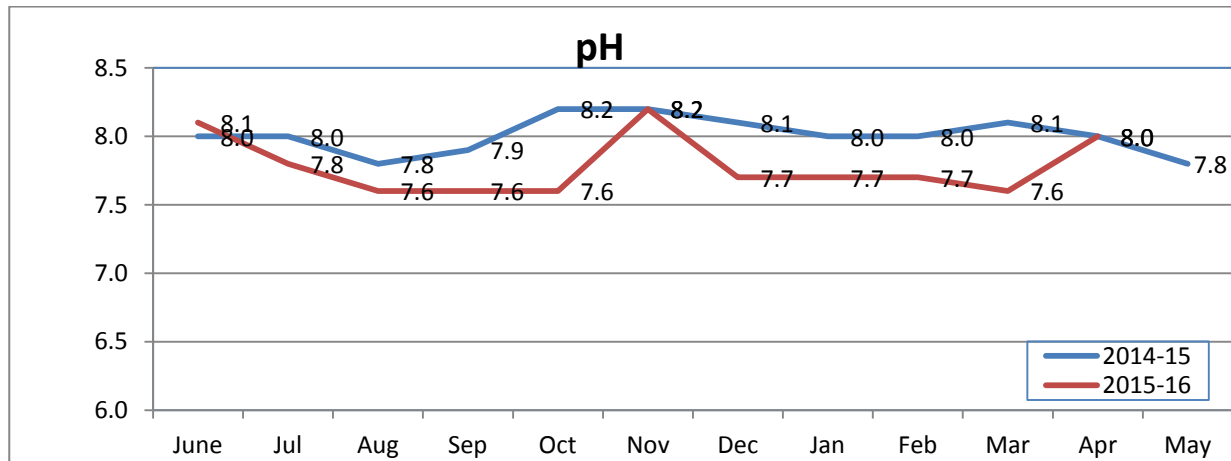


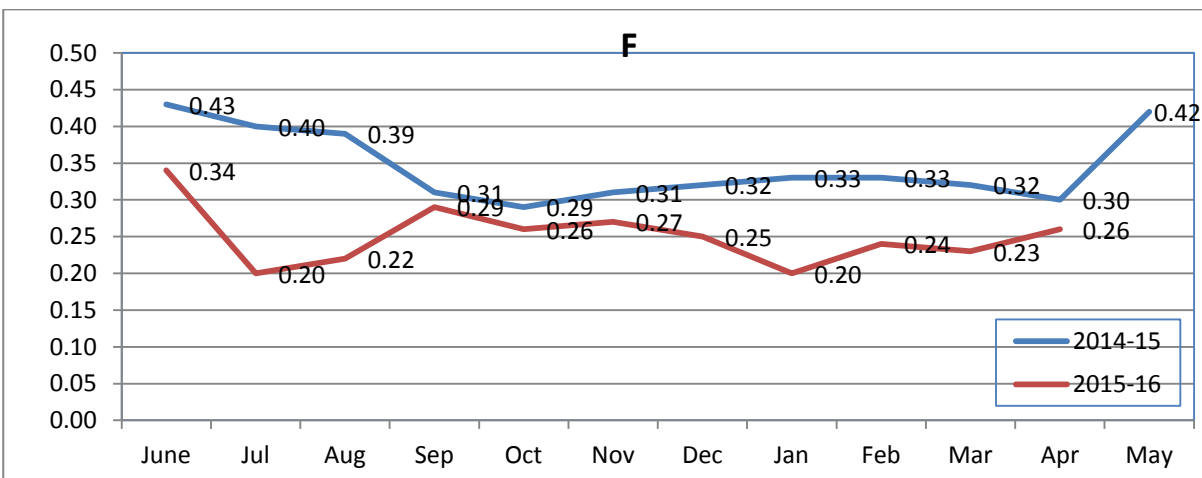
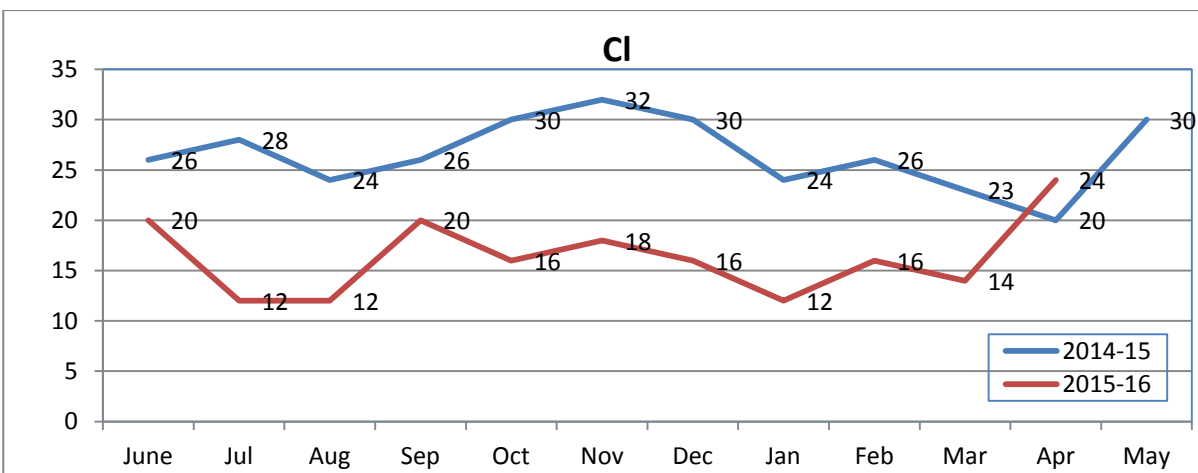
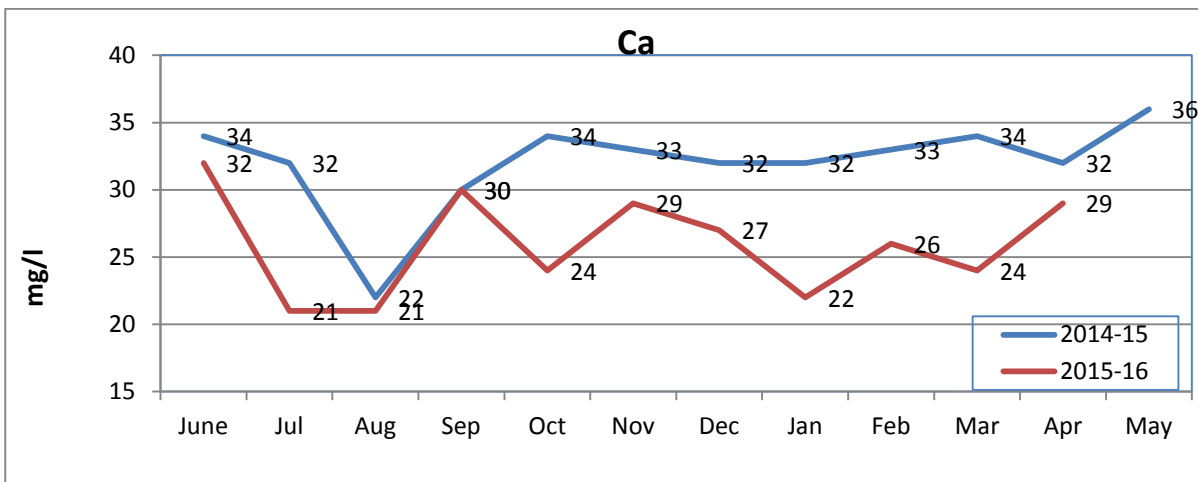


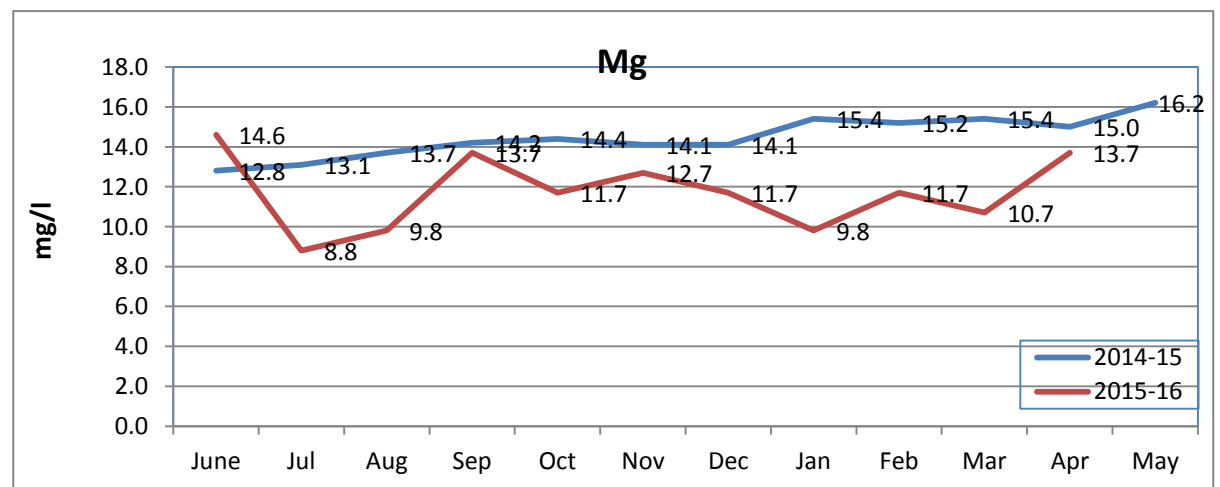
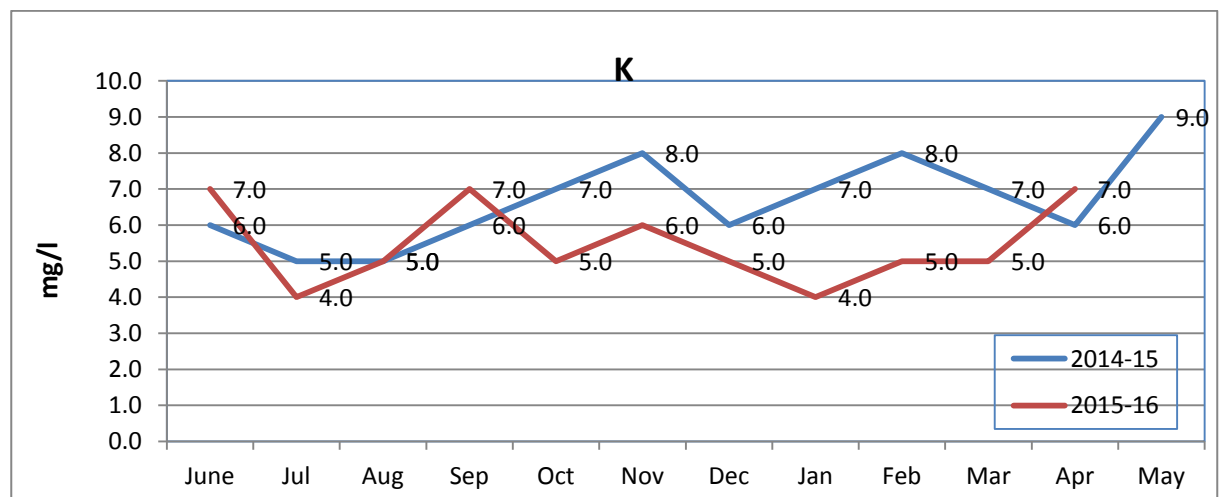
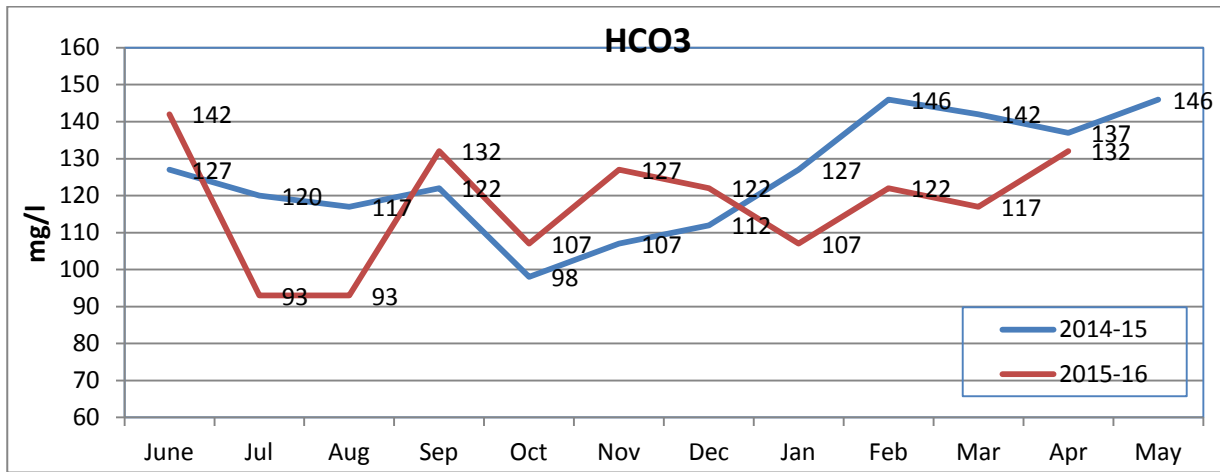


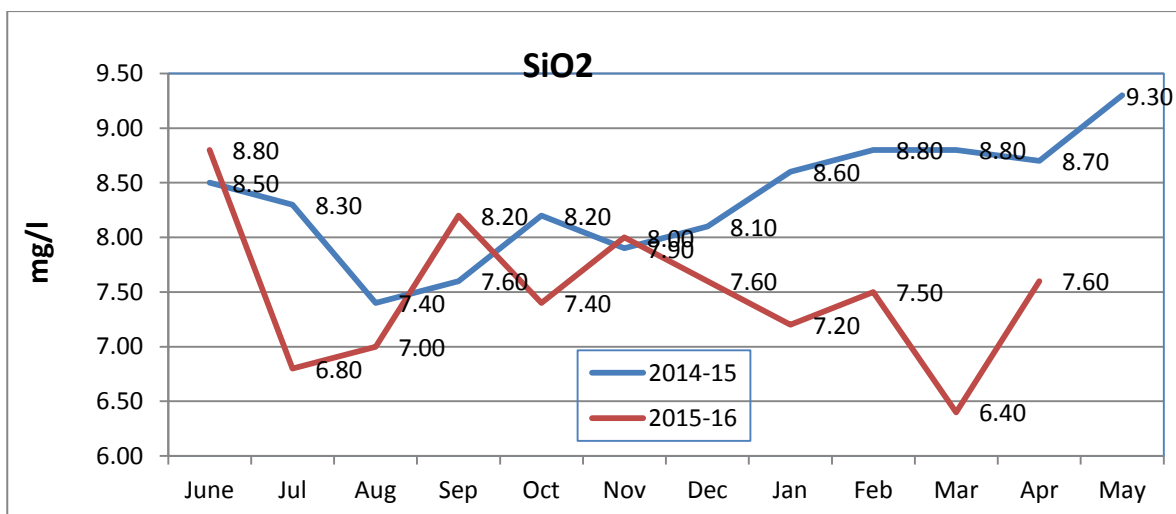
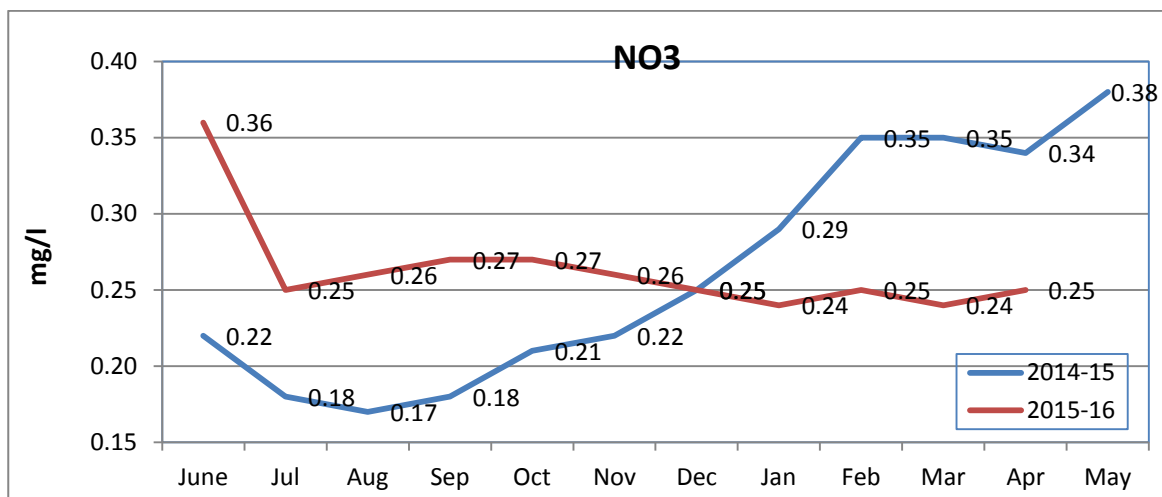
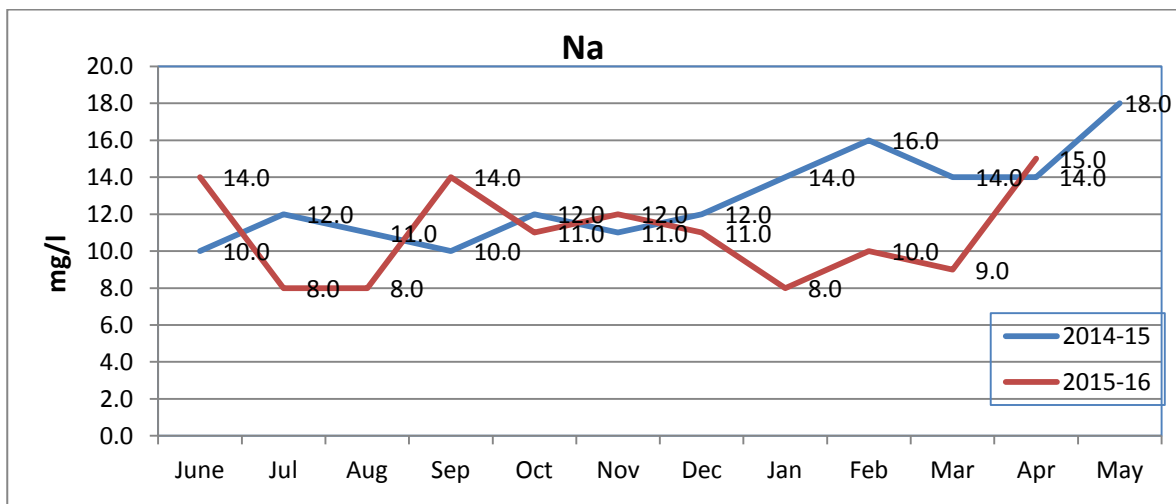


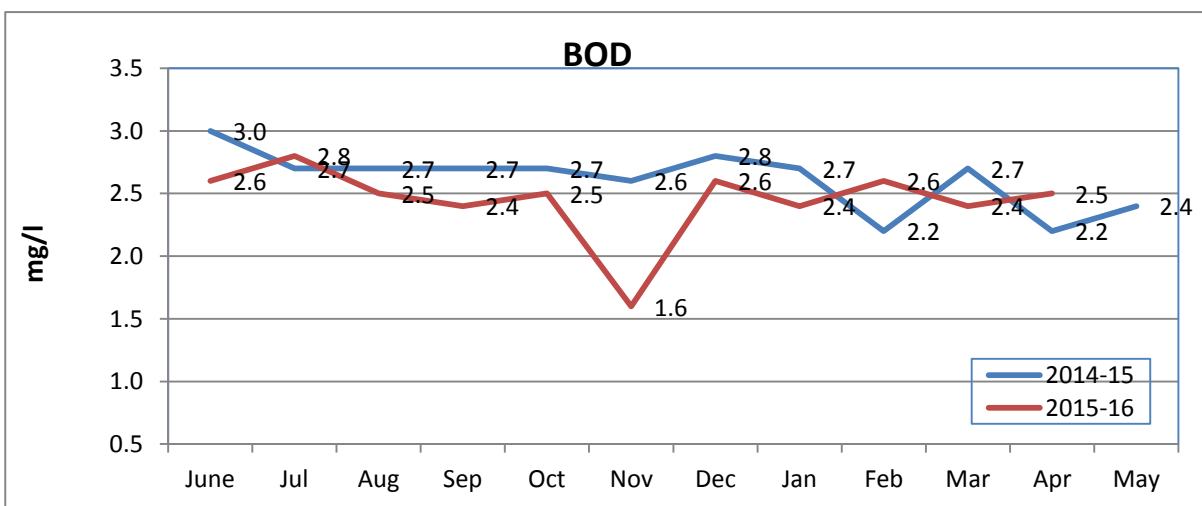
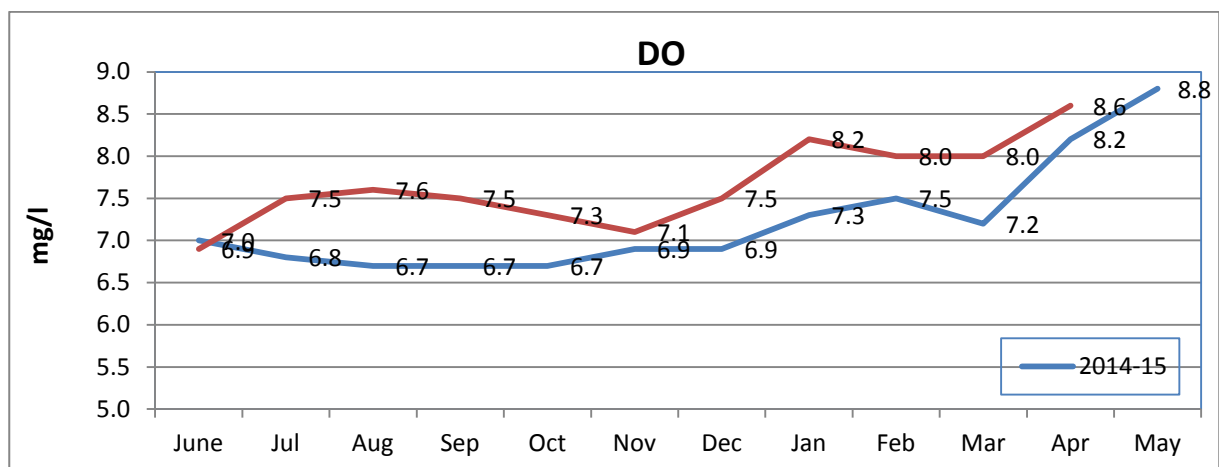
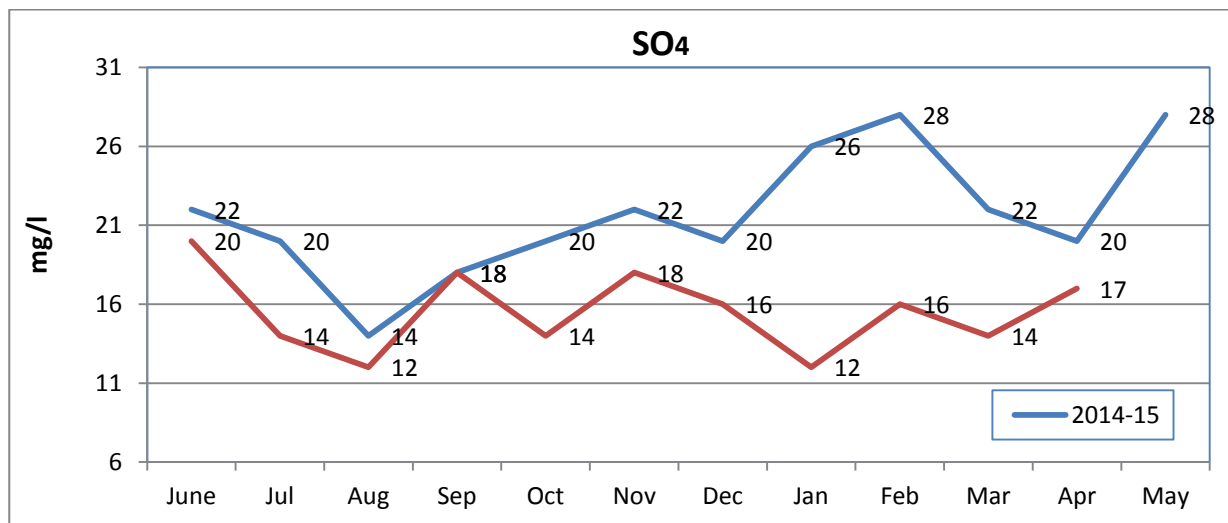
#### 4.4.3 Duddhi- River Kanhar

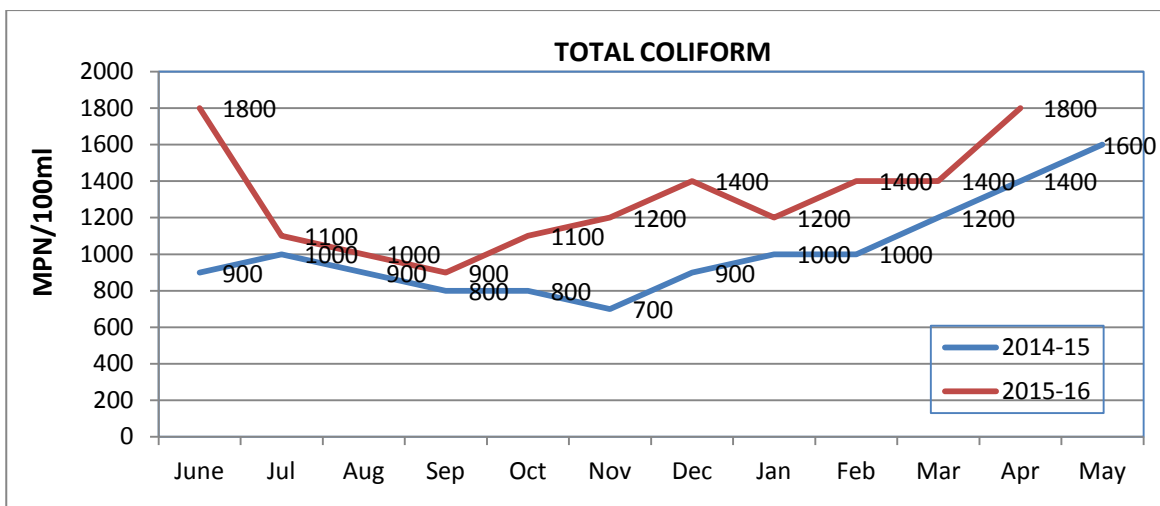
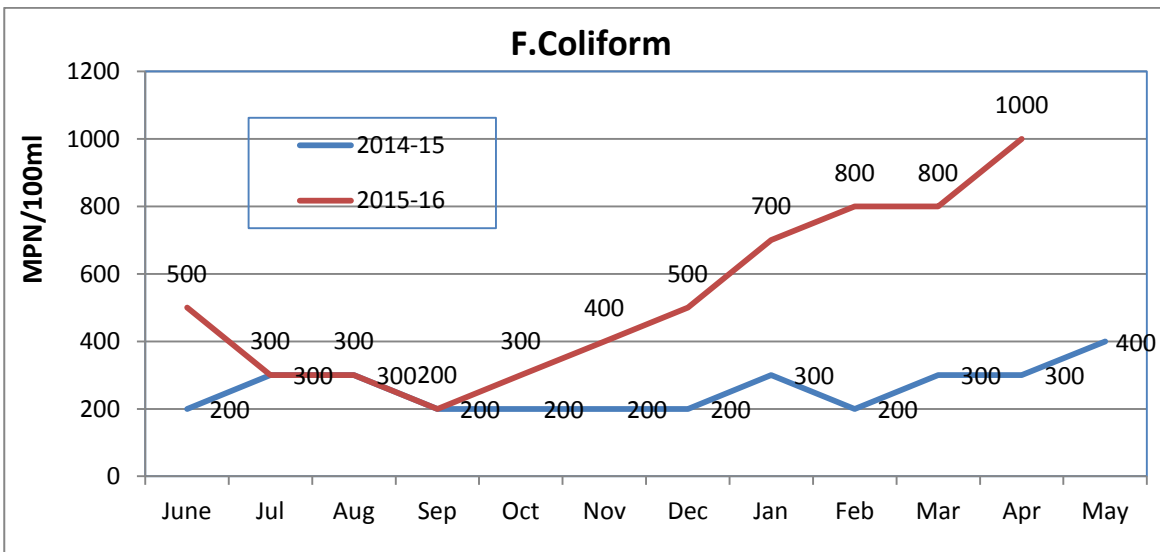
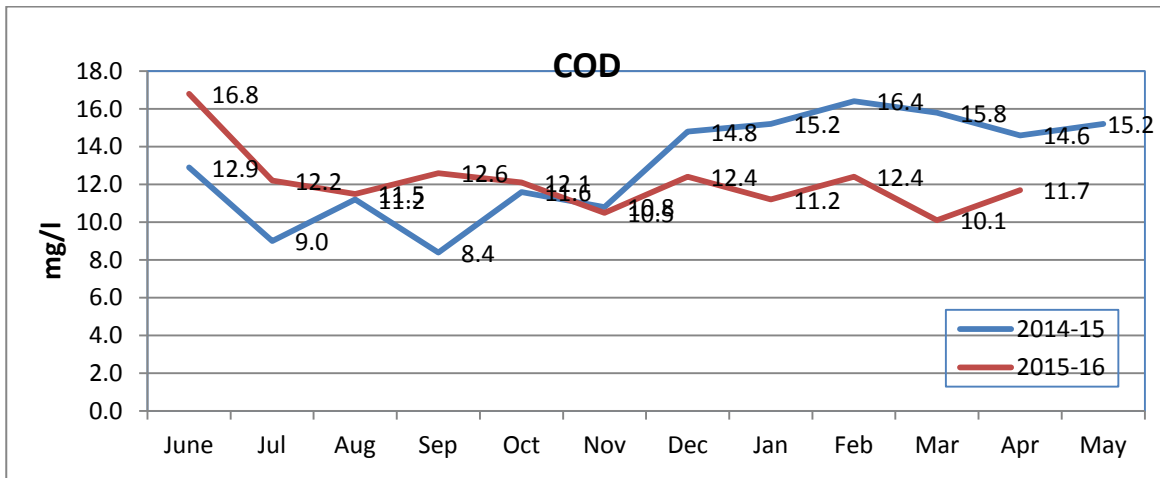


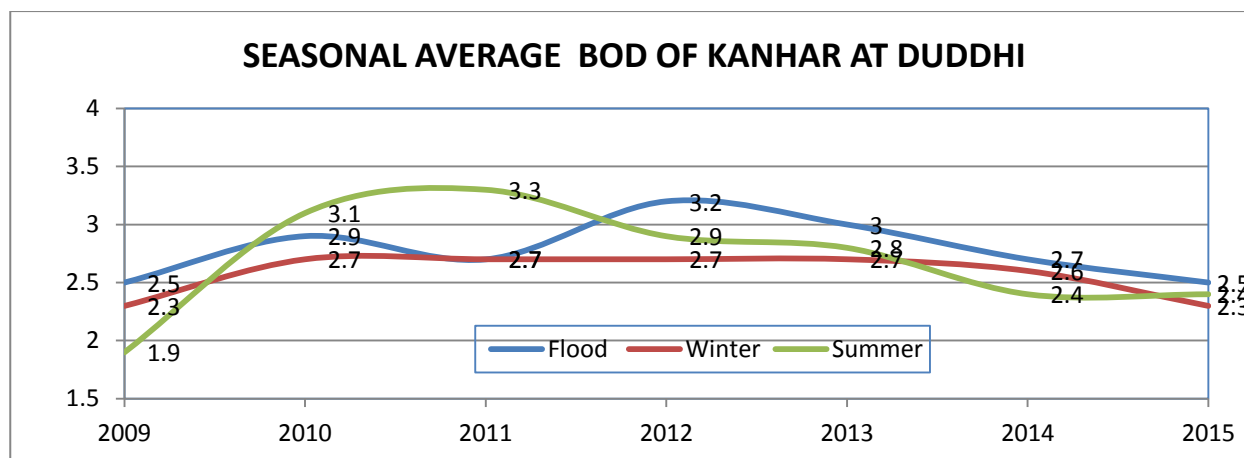
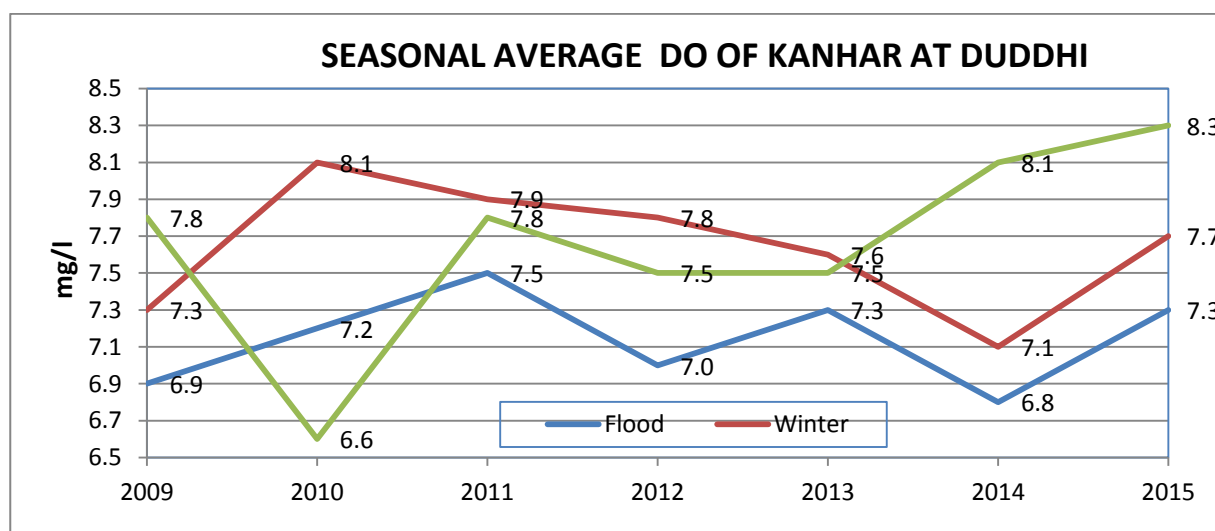
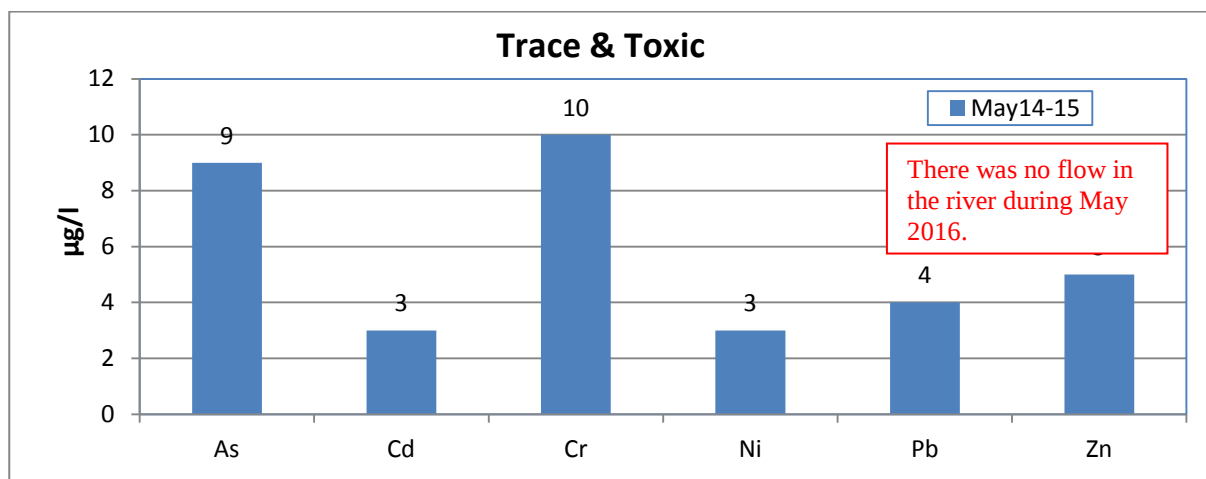












**History Sheet**

**Water Quality**

**Data**

**2015-2016**

## HISTORY SHEET

|                   |                              |                   |                          |
|-------------------|------------------------------|-------------------|--------------------------|
|                   |                              | <b>Water Year</b> | <b>: 2015-2016</b>       |
| <b>Site</b>       | <b>: KULDAH BRIDGE</b>       | <b>Code</b>       | <b>: GGTOOT3</b>         |
| State             | : Madhya Pradesh             | District          | Sidhi                    |
| Basin             | : Ganga-Brahm-Meghna Basin   | Independent River | : Ganga                  |
| Tributary         | : Sone                       | Sub Tributary     | : Banas                  |
| Sub-Sub Tributary | :                            | Local River       | : Sone                   |
| Division          | : M Ganga Div. III, Varanasi | Sub-Division      | : U Sone Rehand SD, Rewa |
| Drainage Area     | : 23276 Sq. Km.              | Bank              | : Right                  |
| Latitude          | : 24°25'00"                  | Longitude         | : 81°41'00"              |
|                   | Opening Date                 | Closing Date      |                          |
| Gauge             | : 13-12-59                   |                   |                          |
| Discharge         | : 13-12-59                   |                   |                          |
| Sediment          | : 01-01-81                   |                   |                          |
| Water Quality     | : 01-11-80                   |                   |                          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | 01-06-15   | 01-07-15   | 01-08-15    | 01-09-15    | 01-10-15    | 02-11-15   | 01-12-15   | 01-01-16   | 01-02-16   | 01-03-16   | 01-04-16   | 02-05-16   |
|------|----------------------|------------|------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|
|      |                      | A          | A          | A           | A           | A           | A          | A          | A          | A          | A          | A          | A          |
|      | <b>PHYSICAL</b>      |            |            |             |             |             |            |            |            |            |            |            |            |
| 1    | Q (cumec)            | 6.059      | 209.0      | 23.83       | 55.75       | 211.7       | 66.87      | 25.01      | 25.17      | 26.64      | 52.81      | 15.81      | 11.21      |
| 2    | Colour_Cod (-)       | Clear      | Brown      | Light Brown | Light Brown | Light Brown | Brown      | Clear      | Clear      | Clear      | Clear      | Clear      | Clear      |
| 3    | EC_FLD (µmho/cm)     | 280        | 180        | 220         | 200         | 230         | 200        | 270        | 260        | 250        | 240        | 280        | 250        |
| 4    | EC_GEN (µmho/cm)     | 277        | 225        | 213         | 193         | 225         | 198        | 261        | 254        | 240        | 230        | 275        | 247        |
| 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)    | 8.1        | 7.6        | 7.9         | 7.4         | 7.5         | 8.0        | 8.0        | 8.0        | 8.0        | 7.7        | 7.7        | 7.7        |
| 7    | pH_GEN (pH units)    | 8.2        | 8.4        | 8.1         | 7.7         | 7.6         | 8.1        | 8.0        | 8.0        | 8.1        | 7.8        | 7.8        | 7.8        |
| 8    | TDS (mg/L)           | 168        | 135        | 128         | 116         | 135         | 120        | 160        | 156        | 144        | 140        | 165        | 142        |
| 9    | Temp (deg C)         | 29.0       | 27.0       | 27.0        | 29.0        | 27.5        | 26.5       | 26.0       | 11.0       | 21.5       | 26.0       | 26.5       | 28.0       |
| 10   | Turb (NTU)           | 0.1        | 4.2        | 1.1         | 1.3         | 1.4         | 5.5        | 0.2        | 0.4        | 0.8        | 0.7        | 0.9        | 1.1        |
|      | <b>CHEMICAL</b>      |            |            |             |             |             |            |            |            |            |            |            |            |
| 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)  | 140        | 112        | 96          | 92          | 120         | 88         | 104        | 104        | 96         | 92         | 104        | 96         |
| 3    | B (mg/L)             | 0.01       | 0.00       | 0.00        | 0.00        | 0.00        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |
| 4    | Ca (mg/L)            | 33         | 24         | 22          | 21          | 29          | 21         | 26         | 24         | 22         | 21         | 24         | 22         |
| 5    | Cl (mg/L)            | 28.0       | 14.0       | 12.0        | 10.0        | 20.0        | 10.0       | 16.0       | 16.0       | 14.0       | 14.0       | 20.0       | 16.0       |
| 6    | 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        |
| 7    | F (mg/L)             | 0.40       | 0.28       | 0.25        | 0.20        | 0.23        | 0.20       | 0.26       | 0.25       | 0.24       | 0.24       | 0.28       | 0.25       |
| 8    | Fe (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        |
| 9    | HCO3 (mg/L)          | 171        | 137        | 117         | 112         | 146         | 107        | 127        | 127        | 117        | 112        | 127        | 117        |
| 10   | K (mg/L)             | 8.0        | 5.0        | 4.0         | 4.0         | 7.0         | 5.0        | 6.0        | 6.0        | 6.0        | 6.0        | 7.0        | 6.0        |
| 11   | Mg (mg/L)            | 19.5       | 11.7       | 9.8         | 8.8         | 14.6        | 9.8        | 12.7       | 12.7       | 11.7       | 11.7       | 13.7       | 11.7       |
| 12   | Na (mg/L)            | 18.0       | 10.0       | 8.0         | 7.0         | 14.0        | 7.0        | 10.0       | 9.0        | 8.0        | 8.0        | 11.0       | 9.0        |
| 13   | NH3-N (mg N/L)       | 0.00       | 0.00       | 0.00        | 0.00        | 0.00        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |
| 14   | NO2+NO3 (mg N/L)     | 0.20       | 0.15       | 0.15        | 0.13        | 0.14        | 0.13       | 0.14       | 0.14       | 0.13       | 0.13       | 0.14       | 0.14       |
| 15   | NO2-N (mgN/L)        | 0.00       | 0.00       | 0.00        | 0.00        | 0.00        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |
| 16   | NO3-N (mgN/L)        | 0.20       | 0.15       | 0.15        | 0.13        | 0.14        | 0.13       | 0.14       | 0.14       | 0.13       | 0.13       | 0.14       | 0.14       |
| 17   | P-Tot (mgP/L)        | 0.026      | 0.024      | 0.022       | 0.018       | 0.022       | 0.020      | 0.024      | 0.022      | 0.020      | 0.018      | 0.142      | 0.018      |
| 18   | SiO2 (mg/L)          | 8.1        | 6.6        | 6.4         | 6.2         | 6.5         | 6.0        | 6.8        | 6.6        | 6.2        | 6.1        | 6.4        | 6.0        |
| 19   | SO4 (mg/L)           | 25.0       | 18.0       | 14.0        | 12.0        | 18.0        | 12.0       | 16.0       | 15.0       | 12.0       | 11.0       | 14.0       | 12.0       |

# Water Quality Datasheet for the period : 2015-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 01-06-15 | 01-07-15 | 01-08-15 | 01-09-15 | 01-10-15 | 02-11-15 | 01-12-15 | 01-01-16 | 01-02-16 | 01-03-16 | 01-04-16 | 02-05-16 |
|------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      |                                   | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| 1    | BOD3-27 (mg/L)                    | 3.3      | 2.9      | 2.8      | 2.7      | 2.9      | 2.4      | 2.0      | 2.4      | 2.7      | 1.8      | 2.2      | 2.4      |
| 2    | COD (mg/L)                        | 18.2     | 5.9      | 7.7      | 8.2      | 8.7      | 10.7     | 12.5     | 11.4     | 12.6     | 9.1      | 10.2     | 9.0      |
| 3    | DO (mg/L)                         | 6.9      | 7.3      | 7.5      | 7.3      | 7.1      | 6.9      | 7.1      | 6.3      | 6.9      | 7.1      | 6.9      | 6.3      |
| 4    | DO_SAT% (%)                       | 89       | 91       | 93       | 94       | 89       | 85       | 87       | 57       | 77       | 87       | 85       | 80       |
| 5    | Fcol-MPN (MPN/100mL)              | 1200     | 900      | 800      | 700      | 900      | 1000     | 1100     | 1200     | 1000     | 1000     | 1100     | 1400     |
| 6    | Tcol-MPN (MPN/100mL)              | 2900     | 2200     | 2000     | 1800     | 2000     | 2200     | 2400     | 2500     | 2300     | 2300     | 3000     | 3300     |
|      | <b>TRACE &amp; TOXIC</b>          |          |          |          |          |          |          |          |          |          |          |          |          |
| 1    | As (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 7.5      |
| 2    | Cd (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 2.0      |
| 3    | Cr (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 8.0      |
| 4    | Ni (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 6.5      |
| 5    | Pb (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 9.0      |
| 6    | Zn (µg/L)                         |          |          |          |          |          |          |          |          |          |          |          | 8.5      |
|      | <b>CHEMICAL INDICES</b>           |          |          |          |          |          |          |          |          |          |          |          |          |
| 1    | HAR_Ca (mgCaCO3/L)                | 82       | 60       | 56       | 52       | 72       | 52       | 64       | 60       | 56       | 52       | 60       | 56       |
| 2    | HAR_Total (mgCaCO3/L)             | 163      | 109      | 97       | 89       | 133      | 93       | 117      | 113      | 105      | 101      | 117      | 105      |
| 3    | Na% (%)                           | 19       | 16       | 15       | 14       | 18       | 13       | 15       | 14       | 13       | 14       | 16       | 15       |
| 4    | RSC (-)                           | 0.0      | 0.1      | 0.0      | 0.1      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      |
| 5    | SAR (-)                           | 0.6      | 0.4      | 0.4      | 0.3      | 0.5      | 0.3      | 0.4      | 0.4      | 0.3      | 0.3      | 0.4      | 0.4      |
|      | <b>PESTICIDES</b>                 |          |          |          |          |          |          |          |          |          |          |          |          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

## Well Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 02-11-15<br>B | 02-05-16<br>B |
|------|-----------------------------------|---------------|---------------|
|      | <b>PHYSICAL</b>                   |               |               |
| 1    | Colour_Cod (-)                    | Clear         | Clear         |
| 2    | EC_FLD (µmho/cm)                  | 790           | 785           |
| 3    | EC_GEN (µmho/cm)                  | 781           | 781           |
| 4    | Odour_Code (-)                    | odour free    | odour free    |
| 5    | pH_FLD (pH units)                 | 7.3           | 7.4           |
| 6    | pH_GEN (pH units)                 | 7.5           | 7.5           |
| 7    | TDS (mg/L)                        | 470           | 472           |
| 8    | Temp (deg C)                      | 26.0          | 26.0          |
|      | <b>CHEMICAL</b>                   |               |               |
| 1    | Alk-Phen (mgCaCO3/L)              | 0.0           | 0.0           |
| 2    | ALK-TOT (mgCaCO3/L)               | 216           | 220           |
| 3    | B (mg/L)                          | 0.00          | 0.00          |
| 4    | Ca (mg/L)                         | 50            | 51            |
| 5    | Cl (mg/L)                         | 50.0          | 52.0          |
| 6    | CO3 (mg/L)                        | 0.0           | 0.0           |
| 7    | F (mg/L)                          | 0.36          | 0.35          |
| 8    | Fe (mg/L)                         | 0.2           | 0.2           |
| 9    | HCO3 (mg/L)                       | 264           | 268           |
| 10   | K (mg/L)                          | 9.0           | 10.0          |
| 11   | Mg (mg/L)                         | 33.2          | 33.2          |
| 12   | Na (mg/L)                         | 34.0          | 35.0          |
| 13   | NH3-N (mg N/L)                    | 0.04          | 0.00          |
| 14   | NO2+NO3 (mg N/L)                  | 0.29          | 0.24          |
| 15   | NO2-N (mgN/L)                     | 0.06          | 0.00          |
| 16   | NO3-N (mgN/L)                     | 0.23          | 0.24          |
| 17   | P-Tot (mgP/L)                     | 0.026         | 0.040         |
| 18   | SiO2 (mg/L)                       | 8.4           | 8.2           |
| 19   | SO4 (mg/L)                        | 66.0          | 68.0          |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |               |               |
|      | <b>TRACE &amp; TOXIC</b>          |               |               |
|      | <b>CHEMICAL INDICES</b>           |               |               |
| 1    | HAR_Ca (mgCaCO3/L)                | 124           | 128           |
| 2    | HAR_Total (mgCaCO3/L)             | 262           | 267           |
| 3    | Na% (%)                           | 21            | 22            |
| 4    | RSC (-)                           | 0.0           | 0.0           |
| 5    | SAR (-)                           | 0.9           | 0.9           |
|      | <b>PESTICIDES</b>                 |               |               |

# Water Quality Summary for the period : 2015-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Division : M Ganga Div. III, Varanasi

Local River : Sone

Sub-Division : U Sone Rehand SD, Rewa

## River Water Summary

| S.No | Parameters                        | Number of Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|------------------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |                        |         |         |       |
| 1    | Q (cumec)                         | 366                    | 332.0   | 6.059   | 67.64 |
| 2    | EC_FLD (µmho/cm)                  | 12                     | 280     | 180     | 238   |
| 3    | EC_GEN (µmho/cm)                  | 12                     | 277     | 193     | 237   |
| 4    | pH_FLD (pH units)                 | 12                     | 8.1     | 7.4     | 7.8   |
| 5    | pH_GEN (pH units)                 | 12                     | 8.4     | 7.6     | 8     |
| 6    | TDS (mg/L)                        | 12                     | 168     | 116     | 142   |
| 7    | Temp (deg C)                      | 12                     | 29.0    | 11.0    | 25.4  |
| 8    | Turb (NTU)                        | 12                     | 5.5     | 0.1     | 1.5   |
|      | <b>CHEMICAL</b>                   |                        |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 12                     | 0.0     | 0.0     | 0     |
| 2    | ALK-TOT (mgCaCO3/L)               | 12                     | 140     | 88      | 104   |
| 3    | B (mg/L)                          | 12                     | 0.01    | 0.00    | 0     |
| 4    | Ca (mg/L)                         | 12                     | 33      | 21      | 24    |
| 5    | Cl (mg/L)                         | 12                     | 28.0    | 10.0    | 15.8  |
| 6    | CO3 (mg/L)                        | 12                     | 0.0     | 0.0     | 0     |
| 7    | F (mg/L)                          | 12                     | 0.40    | 0.20    | 0.26  |
| 8    | Fe (mg/L)                         | 12                     | 0.0     | 0.0     | 0     |
| 9    | HCO3 (mg/L)                       | 12                     | 171     | 107     | 126   |
| 10   | K (mg/L)                          | 12                     | 8.0     | 4.0     | 5.8   |
| 11   | Mg (mg/L)                         | 12                     | 19.5    | 8.8     | 12.4  |
| 12   | Na (mg/L)                         | 12                     | 18.0    | 7.0     | 9.9   |
| 13   | NH3-N (mg N/L)                    | 12                     | 0.00    | 0.00    | 0     |
| 14   | NO2+NO3 (mg N/L)                  | 12                     | 0.20    | 0.13    | 0.14  |
| 15   | NO2-N (mgN/L)                     | 12                     | 0.00    | 0.00    | 0     |
| 16   | NO3-N (mgN/L)                     | 12                     | 0.20    | 0.13    | 0.14  |
| 17   | P-Tot (mgP/L)                     | 12                     | 0.142   | 0.018   | 0.031 |
| 18   | SiO2 (mg/L)                       | 12                     | 8.1     | 6.0     | 6.5   |
| 19   | SO4 (mg/L)                        | 12                     | 25.0    | 11.0    | 14.9  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                        |         |         |       |
| 1    | BOD3-27 (mg/L)                    | 12                     | 3.3     | 1.8     | 2.5   |
| 2    | COD (mg/L)                        | 12                     | 18.2    | 5.9     | 10.4  |
| 3    | DO (mg/L)                         | 12                     | 7.5     | 6.3     | 6.9   |
| 4    | DO_SAT% (%)                       | 12                     | 94      | 57      | 84    |
| 5    | FCol-MPN (MPN/100mL)              | 12                     | 1400    | 700     | 1025  |
| 6    | Tcol-MPN (MPN/100mL)              | 12                     | 3300    | 1800    | 2408  |
|      | <b>TRACE &amp; TOXIC</b>          |                        |         |         |       |
| 1    | As (µg/L)                         | 1                      | 7.5     | 7.5     | 7.5   |
| 2    | Cd (µg/L)                         | 1                      | 2.0     | 2.0     | 2     |
| 3    | Cr (µg/L)                         | 1                      | 8.0     | 8.0     | 8     |
| 4    | Ni (µg/L)                         | 1                      | 6.5     | 6.5     | 6.5   |
| 5    | Pb (µg/L)                         | 1                      | 9.0     | 9.0     | 9     |
| 6    | Zn (µg/L)                         | 1                      | 8.5     | 8.5     | 8.5   |
|      | <b>CHEMICAL INDICES</b>           |                        |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 12                     | 82      | 52      | 60    |
| 2    | HAR_Total (mgCaCO3/L)             | 12                     | 163     | 89      | 112   |
| 3    | Na% (%)                           | 12                     | 19      | 13      | 15    |
| 4    | RSC (-)                           | 12                     | 0.1     | 0.0     | 0     |
| 5    | SAR (-)                           | 12                     | 0.6     | 0.3     | 0.4   |
|      | <b>PESTICIDES</b>                 |                        |         |         |       |

# Water Quality Summary for the period : 2015-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Division : M Ganga Div. III, Varanasi

Local River : Sone

Sub-Division : U Sone Rehand SD, Rewa

## Well Water Summary

| S.No | Parameters                        | Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|--------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |              |         |         |       |
| 1    | EC_FLD (μmho/cm)                  | 2            | 790     | 785     | 788   |
| 2    | EC_GEN (μmho/cm)                  | 2            | 781     | 781     | 781   |
| 3    | pH_FLD (pH units)                 | 2            | 7.4     | 7.3     | 7.4   |
| 4    | pH_GEN (pH units)                 | 2            | 7.5     | 7.5     | 7.5   |
| 5    | TDS (mg/L)                        | 2            | 472     | 470     | 471   |
| 6    | Temp (deg C)                      | 2            | 26.0    | 26.0    | 26.0  |
|      | <b>CHEMICAL</b>                   |              |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 2            | 0.0     | 0.0     | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)               | 2            | 220     | 216     | 218   |
| 3    | B (mg/L)                          | 2            | 0.00    | 0.00    | 0.00  |
| 4    | Ca (mg/L)                         | 2            | 51      | 50      | 50    |
| 5    | Cl (mg/L)                         | 2            | 52.0    | 50.0    | 51.0  |
| 6    | CO3 (mg/L)                        | 2            | 0.0     | 0.0     | 0.0   |
| 7    | F (mg/L)                          | 2            | 0.36    | 0.35    | 0.36  |
| 8    | Fe (mg/L)                         | 2            | 0.2     | 0.2     | 0.2   |
| 9    | HCO3 (mg/L)                       | 2            | 268     | 264     | 266   |
| 10   | K (mg/L)                          | 2            | 10.0    | 9.0     | 9.5   |
| 11   | Mg (mg/L)                         | 2            | 33.2    | 33.2    | 33.2  |
| 12   | Na (mg/L)                         | 2            | 35.0    | 34.0    | 34.5  |
| 13   | NH3-N (mg N/L)                    | 2            | 0.04    | 0.00    | 0.02  |
| 14   | NO2+NO3 (mg N/L)                  | 2            | 0.29    | 0.24    | 0.26  |
| 15   | NO2-N (mgN/L)                     | 2            | 0.06    | 0.00    | 0.03  |
| 16   | NO3-N (mgN/L)                     | 2            | 0.24    | 0.23    | 0.23  |
| 17   | P-Tot (mgP/L)                     | 2            | 0.040   | 0.026   | 0.033 |
| 18   | SiO2 (mg/L)                       | 2            | 8.4     | 8.2     | 8.3   |
| 19   | SO4 (mg/L)                        | 2            | 68.0    | 66.0    | 67.0  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |              |         |         |       |
|      | <b>TRACE &amp; TOXIC</b>          |              |         |         |       |
|      | <b>CHEMICAL INDICES</b>           |              |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 2            | 128     | 124     | 126   |
| 2    | HAR_Total (mgCaCO3/L)             | 2            | 267     | 262     | 264   |
| 3    | Na% (%)                           | 2            | 22      | 21      | 21    |
| 4    | RSC (-)                           | 2            | 0.0     | 0.0     | 0.0   |
| 5    | SAR (-)                           | 2            | 0.9     | 0.9     | 0.9   |
|      | <b>PESTICIDES</b>                 |              |         |         |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Flood<br>Jun - Oct |       |       |       |       |       |       |       |       |       | Wier<br>Nov |           |           |           |           |
|------|----------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-----------|-----------|-----------|-----------|
|      |                      | 2006               | 2007  | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2006-2007   | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>PHYSICAL</b>      |                    |       |       |       |       |       |       |       |       |       |             |           |           |           |           |
| 1    | Q (cumec)            | 210.7              | 56.09 | 52.47 | 53.50 | 100.5 | 212.8 | 62.21 |       | 82.74 | 101.3 | 76.77       | 36.58     | 49.75     | 15.60     | 77.47     |
| 2    | EC_FLD (µmho/cm)     | 210                | 220   | 196   | 180   | 177   | 227   | 244   | 221   | 224   | 222   | 340         | 268       | 231       | 177       | 201       |
| 3    | EC_GEN (µmho/cm)     | 189                | 173   | 188   | 177   | 173   | 218   | 238   | 214   | 219   | 227   | 316         | 234       | 218       | 175       | 196       |
| 4    | pH_FLD (pH units)    | 7.9                | 8.0   | 8.0   | 8.1   | 7.9   | 8.5   | 7.8   | 7.9   | 8.0   | 7.7   | 7.9         | 8.1       | 8.1       | 7.9       | 8.2       |
| 5    | pH_GEN (pH units)    | 8.4                | 8.5   | 8.2   | 8.2   | 8.0   | 8.7   | 7.9   | 8.1   | 8.1   | 8.0   | 8.5         | 8.6       | 8.2       | 8.2       | 8.3       |
| 6    | TDS (mg/L)           |                    |       |       | 91    | 105   | 120   | 168   | 170   | 133   | 136   |             |           |           | 89        | 124       |
| 7    | Temp (deg C)         | 29.1               | 28.6  | 27.8  | 29.2  | 28.6  | 25.1  | 26.8  | 28.4  | 27.7  | 27.9  | 22.1        | 19.4      | 20.6      | 20.0      | 21.9      |
| 8    | Turb (NTU)           |                    |       |       | 0.2   | 0.3   | 0.9   | 0.4   |       | 0.8   | 1.6   |             |           |           | 0.1       | 0.2       |
|      | <b>CHEMICAL</b>      |                    |       |       |       |       |       |       |       |       |       |             |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L) | 12.7               | 0.0   | 0.0   | 8.0   | 2.7   | 0.0   | 0.0   | 3.3   | 0.0   | 0.0   | 5.0         | 5.0       | 0.0       | 2.0       | 6.6       |
| 2    | ALK-TOT (mgCaCO3/L)  | 183                | 91    | 86    | 164   | 128   | 102   | 112   | 118   | 114   | 112   | 257         | 158       | 115       | 163       | 141       |
| 3    | B (mg/L)             | 0.00               | 0.01  | 0.04  | 0.01  | 0.00  | 0.01  | 0.01  | 0.01  | 0.01  | 0.00  | 0.02        | 0.00      | 0.07      | 0.00      | 0.03      |
| 4    | Ca (mg/L)            | 20                 | 34    | 29    | 39    | 30    | 32    | 37    | 36    | 32    | 26    | 21          | 40        | 37        | 25        | 30        |
| 5    | Cl (mg/L)            | 32.0               | 33.2  | 17.3  | 59.7  | 19.8  | 21.8  | 23.6  | 24.4  | 25.5  | 16.8  | 38.5        | 30.8      | 29.2      | 69.1      | 24.0      |
| 6    | CO3 (mg/L)           | 15.4               | 0.0   | 0.0   | 9.6   | 3.2   | 0.0   | 0.0   | 4.0   | 0.0   | 0.0   | 6.0         | 6.0       | 0.0       | 2.4       | 8.0       |
| 7    | F (mg/L)             | 0.05               | 0.28  | 0.13  | 0.43  | 0.53  | 0.35  | 0.45  | 0.43  | 0.34  | 0.27  | 0.05        | 0.23      | 0.18      | 0.20      | 0.43      |
| 8    | Fe (mg/L)            | 0.0                | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0         | 0.5       | 0.0       | 0.0       | 0.0       |
| 9    | HCO3 (mg/L)          | 112                | 111   | 105   | 181   | 149   | 125   | 137   | 136   | 139   | 137   | 151         | 155       | 140       | 194       | 156       |
| 10   | K (mg/L)             | 3.0                | 5.4   | 5.4   | 5.5   | 4.4   | 7.0   | 7.0   | 7.4   | 6.4   | 5.6   | 5.3         | 6.8       | 5.4       | 6.7       | 5.5       |
| 11   | Mg (mg/L)            | 7.0                | 14.6  | 11.3  | 12.7  | 25.4  | 24.4  | 25.1  | 24.1  | 20.0  | 12.9  | 21.3        | 25.7      | 12.4      | 18.2      | 25.6      |
| 12   | Na (mg/L)            | 12.2               | 11.4  | 10.9  | 50.8  | 12.4  | 14.0  | 17.2  | 16.8  | 16.8  | 11.4  | 17.5        | 16.0      | 19.4      | 56.4      | 14.8      |
| 13   | NH3-N (mg N/L)       | 0.05               | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  | 0.05        | 0.05      | 0.05      | 0.05      | 0.05      |
| 14   | NO2+NO3 (mg N/L)     | 0.58               | 0.18  | 0.01  | 0.05  | 0.13  | 0.18  | 0.23  | 0.20  | 0.18  | 0.15  | 0.33        | 0.24      | 0.27      | 0.02      | 0.61      |
| 15   | NO2-N (mgN/L)        | 0.01               | 0.03  | 0.00  | 0.02  | 0.00  | 0.04  | 0.00  | 0.00  | 0.00  | 0.00  | 0.02        | 0.00      | 0.00      | 0.01      | 0.02      |
| 16   | NO3-N (mgN/L)        | 0.57               | 0.15  | 0.01  | 0.03  | 0.13  | 0.15  | 0.23  | 0.20  | 0.18  | 0.15  | 0.30        | 0.24      | 0.27      | 0.01      | 0.59      |
| 17   | P-Tot (mgP/L)        | 0.001              | 0.017 | 0.004 | 0.008 | 0.003 | 0.001 | 0.001 | 0.001 | 0.016 | 0.022 | 0.003       | 0.001     | 0.037     | 0.011     | 0.001     |
| 18   | SiO2 (mg/L)          | 10.7               | 9.7   | 9.1   | 8.0   | 8.4   | 7.6   | 8.3   | 8.4   | 7.9   | 6.8   | 9.8         | 7.2       | 8.3       | 9.4       | 7.8       |
| 19   | SO4 (mg/L)           | 18.0               | 18.6  | 31.0  | 13.3  | 50.0  | 7.6   | 12.0  | 12.0  | 24.4  | 17.4  | 15.5        | 25.3      | 27.4      | 2.9       | 47.5      |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood     |      |      |      |      |      |      |      |      |      | Wier      |           |           |           |           |
|------|-----------------------------------|-----------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                                   | Jun - Oct |      |      |      |      |      |      |      |      |      | Nov       |           |           |           |           |
|      |                                   | 2006      | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | BOD3-27 (mg/L)                    |           |      |      | 2.5  | 2.9  | 2.8  | 2.8  | 2.6  | 2.9  | 2.9  |           |           |           | 2.3       | 3.1       |
| 2    | COD (mg/L)                        |           | 1.3  |      | 3.8  | 9.5  | 10.0 | 10.4 | 8.7  | 14.1 | 9.7  | 1.0       | 1.0       |           | 7.0       | 7.6       |
| 3    | DO (mg/L)                         |           |      |      | 7.1  | 7.3  | 7.6  | 7.4  | 7.2  | 7.2  | 7.2  |           |           |           | 7.3       | 7.8       |
| 4    | DO_SAT% (%)                       |           |      |      | 93   | 93   | 92   | 93   | 93   | 91   | 91   |           |           |           | 81        | 89        |
| 5    | FCol-MPN (MPN/100mL)              |           |      |      | 640  | 640  | 780  | 780  | 640  | 800  | 900  |           |           |           | 1425      | 275       |
| 6    | Tcol-MPN (MPN/100mL)              |           |      |      | 1180 | 1820 | 2040 | 2060 | 1980 | 2140 | 2180 |           |           |           | 2550      | 1100      |
|      | <b>TRACE &amp; TOXIC</b>          |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | As (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 2    | Cd (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 3    | Cr (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 4    | Ni (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 5    | Pb (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 6    | Zn (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
|      | <b>CHEMICAL INDICES</b>           |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)                | 49        | 85   | 74   | 97   | 75   | 80   | 91   | 89   | 80   | 64   | 53        | 101       | 92        | 62        | 74        |
| 2    | HAR_Total (mgCaCO3/L)             | 78        | 146  | 121  | 150  | 181  | 182  | 196  | 190  | 163  | 118  | 141       | 208       | 144       | 138       | 181       |
| 3    | Na% (%)                           | 25        | 14   | 16   | 42   | 13   | 14   | 15   | 16   | 18   | 16   | 21        | 14        | 22        | 46        | 15        |
| 4    | RSC (-)                           | 0.8       | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.1       | 0.0       | 0.0       | 0.5       | 0.0       |
| 5    | SAR (-)                           | 0.6       | 0.4  | 0.4  | 1.8  | 0.4  | 0.5  | 0.5  | 0.5  | 0.6  | 0.4  | 0.6       | 0.5       | 0.7       | 2.1       | 0.5       |
|      | <b>PESTICIDES</b>                 |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Winter    |           |           |           |           | Summer    |       |       |       |       |       |       |       |       |       |  |
|------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|      |                      | Jan - Feb |           |           |           |           | Mar - May |       |       |       |       |       |       |       |       |       |  |
|      |                      | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  |  |
|      | PHYSICAL             |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |  |
| 1    | Q (cumec)            | 29.57     | 52.88     |           | 47.93     | 35.92     | 32.43     | 36.50 | 41.89 | 4.637 | 17.10 | 19.46 | 26.15 |       | 45.14 | 26.61 |  |
| 2    | EC_FLD (µmho/cm)     | 243       | 257       | 239       | 303       | 245       | 263       | 430   | 238   | 215   | 215   | 255   | 259   | 270   | 268   | 257   |  |
| 3    | EC_GEN (µmho/cm)     | 236       | 248       | 232       | 293       | 238       | 235       | 406   | 232   | 211   | 211   | 244   | 252   | 264   | 264   | 251   |  |
| 4    | pH_FLD (pH units)    | 8.5       | 8.1       | 8.1       | 7.9       | 8.0       | 7.7       | 7.6   | 8.1   | 8.1   | 8.1   | 8.6   | 8.4   | 8.1   | 7.6   | 7.7   |  |
| 5    | pH_GEN (pH units)    | 8.6       | 8.3       | 8.3       | 8.0       | 8.1       | 7.9       | 8.4   | 8.2   | 8.3   | 8.2   | 8.7   | 8.5   | 8.3   | 7.8   | 7.8   |  |
| 6    | TDS (mg/L)           | 131       | 169       | 183       | 182       | 145       |           |       |       | 107   | 128   | 155   | 174   | 174   | 165   | 149   |  |
| 7    | Temp (deg C)         | 21.5      | 18.4      | 21.4      | 19.6      | 21.3      | 24.3      | 23.8  | 25.0  | 26.2  | 22.8  | 24.7  | 24.5  | 25.2  | 25.3  | 26.8  |  |
| 8    | Turb (NTU)           | 0.1       | 0.1       |           | 0.3       | 1.7       |           |       |       | 0.1   | 0.1   | 0.1   | 0.1   |       | 0.3   | 0.9   |  |
|      | CHEMICAL             |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |  |
| 1    | Alk-Phen (mgCaCO3/L) | 0.0       | 0.0       | 5.0       | 0.0       | 0.0       | 0.0       | 6.6   | 0.0   | 13.3  | 0.0   | 0.0   | 0.0   | 10.0  | 0.0   | 0.0   |  |
| 2    | ALK-TOT (mgCaCO3/L)  | 106       | 112       | 121       | 123       | 98        | 212       | 146   | 131   | 151   | 97    | 117   | 116   | 140   | 135   | 97    |  |
| 3    | B (mg/L)             | 0.03      | 0.02      | 0.03      | 0.01      | 0.00      | 0.01      |       | 0.02  | 0.00  | 0.04  | 0.04  | 0.04  | 0.03  | 0.00  | 0.00  |  |
| 4    | Ca (mg/L)            | 33        | 34        | 34        | 34        | 23        | 23        | 44    | 53    | 32    | 31    | 34    | 35    | 34    | 33    | 22    |  |
| 5    | Cl (mg/L)            | 28.5      | 27.5      | 22.5      | 29.4      | 14.0      | 32.7      | 30.7  | 51.7  | 50.5  | 19.0  | 29.3  | 30.0  | 26.0  | 26.7  | 16.7  |  |
| 6    | CO3 (mg/L)           | 0.0       | 0.0       | 6.0       | 0.0       | 0.0       | 0.0       | 8.0   | 0.0   | 16.0  | 0.0   | 0.0   | 0.0   | 12.0  | 0.0   | 0.0   |  |
| 7    | F (mg/L)             | 0.45      | 0.43      | 0.42      | 0.38      | 0.24      | 0.06      |       | 0.19  | 0.43  | 0.46  | 0.42  | 0.42  | 0.41  | 0.35  | 0.26  |  |
| 8    | Fe (mg/L)            | 0.1       | 0.1       | 0.0       | 0.0       | 0.0       | 0.0       |       | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |  |
| 9    | HCO3 (mg/L)          | 129       | 137       | 136       | 150       | 120       | 129       | 162   | 160   | 151   | 118   | 143   | 142   | 146   | 164   | 119   |  |
| 10   | K (mg/L)             | 7.8       | 7.3       | 6.8       | 7.3       | 5.8       | 5.0       | 6.3   | 5.6   | 5.7   | 5.0   | 9.3   | 8.7   | 6.7   | 7.7   | 6.3   |  |
| 11   | Mg (mg/L)            | 26.6      | 25.5      | 24.5      | 21.4      | 11.7      | 16.7      | 24.9  | 8.2   | 13.0  | 20.9  | 23.7  | 24.1  | 24.5  | 20.1  | 12.4  |  |
| 12   | Na (mg/L)            | 17.8      | 17.5      | 18.5      | 19.0      | 8.5       | 11.3      | 21.7  | 51.6  | 35.7  | 11.0  | 20.0  | 20.0  | 19.0  | 18.3  | 9.3   |  |
| 13   | NH3-N (mg N/L)       | 0.05      | 0.05      | 0.05      | 0.00      | 0.00      | 0.05      |       | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |  |
| 14   | NO2+NO3 (mg N/L)     | 0.36      | 0.22      | 0.23      | 0.21      | 0.14      | 0.01      |       | 0.01  | 0.02  | 0.34  | 0.34  | 0.26  | 0.22  | 0.19  | 0.14  |  |
| 15   | NO2-N (mgN/L)        | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |       | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |  |
| 16   | NO3-N (mgN/L)        | 0.36      | 0.22      | 0.23      | 0.21      | 0.14      | 0.01      |       | 0.01  | 0.02  | 0.34  | 0.34  | 0.26  | 0.22  | 0.19  | 0.14  |  |
| 17   | P-Tot (mgP/L)        | 0.001     | 0.004     | 0.001     | 0.022     | 0.021     | 0.007     |       | 0.042 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.023 | 0.059 |  |
| 18   | SiO2 (mg/L)          | 8.1       | 8.2       | 8.3       | 7.9       | 6.4       | 9.1       |       | 8.5   | 9.2   | 8.3   | 8.4   | 8.4   | 8.5   | 7.8   | 6.2   |  |
| 19   | SO4 (mg/L)           | 10.9      | 16.3      | 12.8      | 24.0      | 13.8      | 12.0      | 29.5  | 30.0  | 5.1   | 55.0  | 12.7  | 15.0  | 13.0  | 23.3  | 12.3  |  |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Winter<br>Jan - Feb |           |           |           |           | Summer<br>Mar - May |      |      |      |      |      |      |      |      |      |
|------|-----------------------------------|---------------------|-----------|-----------|-----------|-----------|---------------------|------|------|------|------|------|------|------|------|------|
|      |                                   | 2011-2012           | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007                | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                     |           |           |           |           |                     |      |      |      |      |      |      |      |      |      |
| 1    | BOD3-27 (mg/L)                    | 2.4                 | 2.7       | 2.7       | 2.8       | 2.3       |                     |      |      | 1.9  | 2.3  | 2.4  | 2.8  | 2.6  | 2.9  | 2.1  |
| 2    | COD (mg/L)                        | 9.9                 | 13.0      | 9.9       | 14.7      | 11.8      | 1.0                 |      |      | 16.5 | 9.3  | 11.0 | 12.5 | 11.4 | 16.1 | 9.4  |
| 3    | DO (mg/L)                         | 8.1                 | 7.9       | 7.5       | 7.9       | 6.8       |                     |      |      | 7.6  | 7.5  | 7.8  | 7.7  | 7.4  | 7.4  | 6.7  |
| 4    | DO_SAT% (%)                       | 92                  | 84        | 84        | 86        | 76        |                     |      |      | 94   | 87   | 94   | 92   | 89   | 90   | 84   |
| 5    | FCol-MPN (MPN/100mL)              | 775                 | 775       | 750       | 725       | 1075      |                     |      |      | 1567 | 467  | 633  | 633  | 1000 | 1000 | 1167 |
| 6    | Tcol-MPN (MPN/100mL)              | 2200                | 2050      | 2100      | 1900      | 2350      |                     |      |      | 2400 | 1567 | 2300 | 2233 | 2400 | 2433 | 2867 |
|      | <b>TRACE &amp; TOXIC</b>          |                     |           |           |           |           |                     |      |      |      |      |      |      |      |      |      |
| 1    | As (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 10.0 | 19.0 | 17.0 | 15.5 | 12.0 | 7.5  |
| 2    | Cd (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 4.0  | 7.9  | 8.2  | 7.7  | 5.0  | 2.0  |
| 3    | Cr (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 12.0 | 14.0 | 15.0 | 13.9 | 11.0 | 8.0  |
| 4    | Ni (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 15.0 | 8.0  | 10.0 | 12.2 | 14.0 | 6.5  |
| 5    | Pb (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 45.0 | 12.7 | 11.4 | 14.6 | 11.0 | 9.0  |
| 6    | Zn (µg/L)                         |                     |           |           |           |           |                     |      |      |      | 17.0 | 5.0  | 9.5  | 10.0 | 12.0 | 8.5  |
|      | <b>CHEMICAL INDICES</b>           |                     |           |           |           |           |                     |      |      |      |      |      |      |      |      |      |
| 1    | HAR_Ca (mgCaCO3/L)                | 82                  | 85        | 84        | 86        | 58        | 58                  | 109  | 132  | 80   | 78   | 85   | 86   | 84   | 84   | 56   |
| 2    | HAR_Total (mgCaCO3/L)             | 193                 | 191       | 186       | 175       | 107       | 127                 | 213  | 166  | 134  | 165  | 184  | 187  | 186  | 167  | 108  |
| 3    | Na% (%)                           | 16                  | 16        | 17        | 18        | 14        | 16                  | 18   | 39   | 36   | 12   | 18   | 18   | 18   | 18   | 15   |
| 4    | RSC (-)                           | 0.0                 | 0.0       | 0.0       | 0.0       | 0.0       | 0.0                 | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 5    | SAR (-)                           | 0.6                 | 0.6       | 0.6       | 0.6       | 0.4       | 0.4                 | 0.6  | 1.7  | 1.4  | 0.4  | 0.6  | 0.6  | 0.6  | 0.6  | 0.4  |
|      | <b>PESTICIDES</b>                 |                     |           |           |           |           |                     |      |      |      |      |      |      |      |      |      |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood     |       |       |       |       |      |      |      |      |      | Wier      |           |           |           |           |
|------|-----------------------------------|-----------|-------|-------|-------|-------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                                   | Jun - Oct |       |       |       |       |      |      |      |      |      | Nov       |           |           |           |           |
|      |                                   | 2006      | 2007  | 2008  | 2009  | 2010  | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>PHYSICAL</b>                   |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
| 1    | EC_FLD (µmho/cm)                  | 732       | 560   | 758   | 943   | 648   |      |      |      |      |      | 755       | 428       | 625       | 713       | 1042      |
| 2    | EC_GEN (µmho/cm)                  | 705       | 535   | 744   | 938   | 643   |      |      |      |      |      | 734       | 352       | 616       | 710       | 1038      |
| 3    | pH_FLD (pH units)                 | 7.8       | 7.8   | 7.4   | 7.9   | 7.9   |      |      |      |      |      | 7.3       | 8.1       | 7.5       | 7.8       | 8.0       |
| 4    | pH_GEN (pH units)                 | 8.2       | 8.3   | 8.3   | 8.1   | 8.1   |      |      |      |      |      | 8.0       | 8.5       | 8.2       | 7.9       | 8.1       |
| 5    | TDS (mg/L)                        |           |       |       | 428   | 368   |      |      |      |      |      |           |           |           | 433       | 601       |
| 6    | Temp (deg C)                      | 28.4      | 28.0  | 27.3  | 28.2  | 27.6  |      |      |      |      |      | 25.0      | 21.0      | 22.9      | 21.6      | 24.3      |
|      | <b>CHEMICAL</b>                   |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L)              | 16.8      | 39.8  | 9.4   | 3.2   | 6.6   |      |      |      |      |      | 29.0      | 18.9      | 5.0       | 0.0       | 5.0       |
| 2    | ALK-TOT (mgCaCO3/L)               | 428       | 257   | 117   | 237   | 144   |      |      |      |      |      | 646       | 282       | 226       | 306       | 147       |
| 3    | B (mg/L)                          | 0.00      | 0.04  | 0.00  | 0.05  | 0.01  |      |      |      |      |      | 0.02      | 0.00      | 0.00      | 0.00      | 0.00      |
| 4    | Ca (mg/L)                         | 42        | 54    | 49    | 53    | 46    |      |      |      |      |      | 35        | 53        | 64        | 64        | 47        |
| 5    | Cl (mg/L)                         | 26.2      | 34.2  | 22.8  | 57.8  | 39.6  |      |      |      |      |      | 39.3      | 29.0      | 39.4      | 68.5      | 45.8      |
| 6    | CO3 (mg/L)                        | 20.2      | 48.0  | 11.4  | 3.8   | 8.0   |      |      |      |      |      | 35.0      | 22.8      | 6.0       | 0.0       | 6.0       |
| 7    | F (mg/L)                          | 0.14      | 0.50  | 0.36  | 0.51  | 0.72  |      |      |      |      |      | 0.15      | 0.58      | 0.28      | 0.25      | 0.44      |
| 8    | Fe (mg/L)                         | 0.0       | 0.4   | 0.0   | 0.1   | 0.3   |      |      |      |      |      | 0.0       | 0.7       | 0.0       | 0.2       | 0.2       |
| 9    | HCO3 (mg/L)                       | 270       | 216   | 119   | 281   | 159   |      |      |      |      |      | 358       | 232       | 264       | 373       | 167       |
| 10   | K (mg/L)                          | 5.4       | 4.4   | 5.7   | 10.5  | 7.6   |      |      |      |      |      | 8.8       | 6.3       | 5.7       | 3.2       | 7.8       |
| 11   | Mg (mg/L)                         | 35.0      | 48.5  | 28.0  | 27.7  | 28.0  |      |      |      |      |      | 44.0      | 39.0      | 37.8      | 51.0      | 30.1      |
| 12   | Na (mg/L)                         | 21.8      | 28.8  | 12.5  | 52.6  | 24.0  |      |      |      |      |      | 33.0      | 23.3      | 33.6      | 56.2      | 29.0      |
| 13   | NH3-N (mg N/L)                    | 0.05      | 0.05  | 0.05  | 0.05  | 0.05  |      |      |      |      |      | 0.05      | 0.05      | 0.05      | 0.05      | 0.05      |
| 14   | NO2+NO3 (mg N/L)                  | 0.41      | 0.97  | 0.02  | 0.01  | 0.11  |      |      |      |      |      | 0.48      | 0.01      | 0.09      | 0.01      | 0.28      |
| 15   | NO2-N (mgN/L)                     | 0.06      | 0.00  | 0.01  | 0.00  | 0.01  |      |      |      |      |      | 0.10      | 0.00      | 0.00      | 0.00      | 0.04      |
| 16   | NO3-N (mgN/L)                     | 0.36      | 0.97  | 0.01  | 0.01  | 0.10  |      |      |      |      |      | 0.38      | 0.01      | 0.09      | 0.01      | 0.25      |
| 17   | P-Tot (mgP/L)                     | 0.063     | 0.012 | 0.001 | 0.025 | 0.001 |      |      |      |      |      | 0.019     | 0.001     | 0.001     | 0.017     | 0.001     |
| 18   | SiO2 (mg/L)                       | 11.7      | 10.1  | 7.9   | 8.2   | 10.5  |      |      |      |      |      | 9.5       | 9.2       | 9.5       | 17.9      | 9.3       |
| 19   | SO4 (mg/L)                        | 55.8      | 38.8  | 109.7 | 45.7  | 87.6  |      |      |      |      |      | 48.8      | 34.5      | 69.6      | 67.1      | 89.8      |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
|      | <b>TRACE &amp; TOXIC</b>          |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Flood     |      |      |      |      |      |      |      |      |      | Wier      |           |           |           |           |
|------|-------------------------|-----------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                         | Jun - Oct |      |      |      |      |      |      |      |      |      | Nov       |           |           |           |           |
|      |                         | 2006      | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>CHEMICAL INDICES</b> |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)      | 105       | 134  | 123  | 133  | 115  |      |      |      |      |      | 87        | 133       | 159       | 160       | 118       |
| 2    | HAR_Total (mgCaCO3/L)   | 251       | 337  | 240  | 249  | 232  |      |      |      |      |      | 270       | 296       | 317       | 372       | 243       |
| 3    | Na% (%)                 | 17        | 16   | 10   | 31   | 18   |      |      |      |      |      | 20        | 14        | 18        | 25        | 20        |
| 4    | RSC (-)                 | 0.8       | 0.0  | 0.0  | 0.1  | 0.0  |      |      |      |      |      | 1.8       | 0.0       | 0.0       | 0.0       | 0.0       |
| 5    | SAR (-)                 | 0.6       | 0.7  | 0.4  | 1.5  | 0.7  |      |      |      |      |      | 0.9       | 0.6       | 0.8       | 1.3       | 0.8       |
|      | <b>PESTICIDES</b>       |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Winter    |           |           |           |           | Summer    |      |       |       |       |       |       |       |       |       |
|------|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |                                   | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | Mar - May |      |       |       |       |       |       |       |       |       |
|      |                                   | 2007      | 2008      | 2009      | 2010      | 2011      | 2012      | 2013 | 2014  | 2015  | 2016  |       |       |       |       |       |
|      | <b>PHYSICAL</b>                   |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
| 1    | EC_FLD (µmho/cm)                  | 1000      | 999       | 990       | 1000      | 790       | 757       | 603  | 730   | 828   | 2010  | 1108  | 1090  | 1010  | 720   | 785   |
| 2    | EC_GEN (µmho/cm)                  | 985       | 994       | 980       | 980       | 781       | 728       | 579  | 720   | 825   | 2004  | 1096  | 1078  | 994   | 711   | 781   |
| 3    | pH_FLD (pH units)                 | 8.1       | 8.5       | 8.1       | 8.3       | 7.3       | 7.0       | 7.8  | 7.6   | 8.1   | 7.7   | 8.3   | 8.2   | 8.3   | 8.0   | 7.4   |
| 4    | pH_GEN (pH units)                 | 8.2       | 8.6       | 8.3       | 8.4       | 7.4       | 7.6       | 8.2  | 8.1   | 8.2   | 7.8   | 8.4   | 8.4   | 8.5   | 8.1   | 7.5   |
| 5    | TDS (mg/L)                        | 662       | 682       | 652       | 608       | 470       |           |      |       | 412   | 1110  | 626   | 678   | 688   | 427   | 472   |
| 6    | Temp (deg C)                      | 27.5      | 25.0      | 26.0      | 26.5      | 26.0      | 25.0      | 22.2 | 24.3  | 23.7  | 25.0  | 24.5  | 26.5  | 26.0  | 26.5  | 26.0  |
|      | <b>CHEMICAL</b>                   |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 19.9      | 19.9      | 10.0      | 19.9      | 0.0       | 30.4      | 15.9 | 0.0   | 26.6  | 0.0   | 19.9  | 19.9  | 19.9  | 0.0   | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)               | 104       | 108       | 124       | 188       | 216       | 460       | 207  | 274   | 336   | 113   | 112   | 112   | 155   | 148   | 220   |
| 3    | B (mg/L)                          | 0.00      | 0.00      | 0.02      | 0.00      | 0.00      | 0.01      |      | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.03  | 0.00  | 0.00  |
| 4    | Ca (mg/L)                         | 50        | 50        | 47        | 52        | 50        | 58        | 51   | 65    | 80    | 42    | 63    | 64    | 53    | 43    | 51    |
| 5    | Cl (mg/L)                         | 24.0      | 26.0      | 30.0      | 54.0      | 50.0      | 32.3      | 30.7 | 69.3  | 58.0  | 31.0  | 28.0  | 28.0  | 34.0  | 46.0  | 52.0  |
| 6    | CO3 (mg/L)                        | 24.0      | 24.0      | 12.0      | 24.0      | 0.0       | 36.7      | 19.2 | 0.1   | 32.0  | 0.0   | 24.0  | 24.0  | 24.0  | 0.0   | 0.0   |
| 7    | F (mg/L)                          | 0.44      | 0.43      | 0.39      | 0.40      | 0.36      | 0.23      |      | 0.26  | 0.72  | 0.49  | 0.47  | 0.47  | 0.42  | 0.32  | 0.35  |
| 8    | Fe (mg/L)                         | 0.2       | 0.2       | 0.2       | 0.2       | 0.2       | 0.0       |      | 0.0   | 0.1   | 0.2   | 0.2   | 0.2   | 0.3   | 0.2   | 0.2   |
| 9    | HCO3 (mg/L)                       | 78        | 83        | 127       | 181       | 264       | 243       | 213  | 334   | 345   | 137   | 88    | 88    | 140   | 181   | 268   |
| 10   | K (mg/L)                          | 9.0       | 10.0      | 17.0      | 10.2      | 9.0       | 6.0       | 7.3  | 9.9   | 4.6   | 8.0   | 8.0   | 8.0   | 20.0  | 8.0   | 10.0  |
| 11   | Mg (mg/L)                         | 31.4      | 32.3      | 30.8      | 29.9      | 33.2      | 45.7      | 36.6 | 40.7  | 35.0  | 23.9  | 35.9  | 37.1  | 32.9  | 28.3  | 33.2  |
| 12   | Na (mg/L)                         | 32.0      | 34.0      | 30.0      | 32.0      | 34.0      | 25.7      | 27.3 | 52.5  | 56.5  | 18.0  | 30.0  | 32.0  | 36.0  | 29.0  | 35.0  |
| 13   | NH3-N (mg N/L)                    | 0.06      | 0.05      | 0.05      | 0.04      | 0.04      | 0.05      |      | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.04  | 0.00  |
| 14   | NO2+NO3 (mg N/L)                  | 0.37      | 0.35      | 0.32      | 0.35      | 0.29      | 0.04      |      | 0.15  | 0.01  | 0.25  | 0.26  | 0.27  | 0.39  | 0.28  | 0.24  |
| 15   | NO2-N (mgN/L)                     | 0.08      | 0.06      | 0.00      | 0.07      | 0.06      | 0.00      |      | 0.01  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.06  | 0.00  |
| 16   | NO3-N (mgN/L)                     | 0.29      | 0.29      | 0.32      | 0.28      | 0.23      | 0.04      |      | 0.14  | 0.01  | 0.25  | 0.26  | 0.27  | 0.39  | 0.22  | 0.24  |
| 17   | P-Tot (mgP/L)                     | 0.001     | 0.001     | 0.005     | 0.026     | 0.026     | 0.002     |      | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.007 | 0.020 | 0.040 |
| 18   | SiO2 (mg/L)                       | 8.7       | 9.2       | 8.9       | 8.6       | 8.4       | 14.4      |      | 8.9   | 11.3  | 9.4   | 9.3   | 9.2   | 9.3   | 8.1   | 8.2   |
| 19   | SO4 (mg/L)                        | 78.0      | 76.0      | 27.0      | 70.0      | 66.0      | 49.0      | 33.7 | 44.3  | 46.1  | 76.0  | 72.0  | 70.0  | 30.0  | 62.0  | 68.0  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
|      | <b>TRACE &amp; TOXIC</b>          |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : KULDAH BRIDGE ( GGTOOT3)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Winter    |           |           |           |           | Summer    |      |      |      |      |      |      |      |      |      |
|------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|------|------|
|      |                         | Jan - Feb |           |           |           |           | Mar - May |      |      |      |      |      |      |      |      |      |
|      |                         | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|      | <b>CHEMICAL INDICES</b> |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |
| 1    | HAR_Ca (mgCaCO3/L)      | 125       | 126       | 118       | 129       | 124       | 144       | 128  | 162  | 199  | 104  | 159  | 160  | 132  | 108  | 128  |
| 2    | HAR_Total (mgCaCO3/L)   | 256       | 260       | 247       | 254       | 262       | 334       | 281  | 332  | 345  | 204  | 308  | 314  | 269  | 226  | 267  |
| 3    | Na% (%)                 | 21        | 21        | 20        | 21        | 21        | 14        | 17   | 25   | 26   | 16   | 17   | 18   | 21   | 21   | 22   |
| 4    | RSC (-)                 | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0  | 0.0  | 0.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 5    | SAR (-)                 | 0.9       | 0.9       | 0.8       | 0.9       | 0.9       | 0.6       | 0.7  | 1.3  | 1.3  | 0.6  | 0.7  | 0.8  | 1.0  | 0.8  | 0.9  |
|      | <b>PESTICIDES</b>       |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |

## HISTORY SHEET

|                   |                              |                   |                          |
|-------------------|------------------------------|-------------------|--------------------------|
|                   |                              | <b>Water Year</b> | <b>: 2015-2016</b>       |
| <b>Site</b>       | <b>: CHOPAN</b>              | <b>Code</b>       | <b>: GGTOOLS</b>         |
| State             | : Uttar Pradesh              | District          | Sonbhadra                |
| Basin             | : Ganga-Brahm-Meghna Basin   | Independent River | : Ganga                  |
| Tributary         | : Sone                       | Sub Tributary     | : -                      |
| Sub-Sub Tributary | : -                          | Local River       | : Sone                   |
| Division          | : M Ganga Div. III, Varanasi | Sub-Division      | : U Sone Rehand SD, Rewa |
| Drainage Area     | : 46198 Sq. Km.              | Bank              | : Right                  |
| Latitude          | : 24°32'00"                  | Longitude         | : 83°03'00"              |
|                   | Opening Date                 | Closing Date      |                          |
| Gauge             | : 26-04-59                   |                   |                          |
| Discharge         | : 26-04-59                   |                   |                          |
| Sediment          | : 01-01-63                   |                   |                          |
| Water Quality     | : 01-09-63                   |                   |                          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | 01-06-2015  | 01-07-2015  | 01-08-2015  | 01-09-2015  | 01-10-2015  | 02-11-2015  | 01-12-2015 | 01-01-2016 | 01-02-2016 | 01-03-2016 | 01-04-2016 | 02-05-2016 |
|------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|
|      |                      | A           | A           | A           | A           | A           | A           | A          | A          | A          | A          | A          | A          |
|      | <b>PHYSICAL</b>      |             |             |             |             |             |             |            |            |            |            |            |            |
| 1    | Q (cumec)            | 231.0       | 265.3       | 260.8       | 343.4       | 247.7       | 231.8       | 134.8      | 132.4      | 147.5      | 294.2      | 48.06      | 41.16      |
| 2    | Colour_Cod (-)       | Light Brown | Light Brown | Light Brown | Light Brown | Light Brown | Light Brown | Clear      | Clear      | Clear      | Clear      | Clear      | Clear      |
| 3    | EC_FLD (μmho/cm)     | 210         | 220         | 150         | 170         | 160         | 150         | 220        | 160        | 170        | 140        | 250        | 190        |
| 4    | EC_GEN (μmho/cm)     | 164         | 182         | 148         | 169         | 159         | 140         | 210        | 157        | 169        | 136        | 240        | 189        |
| 5    | Odour_Code (-)       | odour free  | odour free  | odour free  | odour free  | odour free  | odour free  | odour free | odour free | odour free | odour free | odour free | odour free |
| 6    | pH_FLD (pH units)    | 7.8         | 7.5         | 7.9         | 7.2         | 7.0         | 7.1         | 7.4        | 7.5        | 7.5        | 7.5        | 7.7        | 7.7        |
| 7    | pH_GEN (pH units)    | 8.0         | 7.6         | 8.1         | 7.4         | 7.6         | 7.6         | 7.9        | 7.7        | 7.7        | 7.6        | 7.8        | 7.9        |
| 8    | TDS (mg/L)           | 99          | 108         | 89          | 101         | 96          | 84          | 126        | 95         | 101        | 84         | 144        | 114        |
| 9    | Temp (deg C)         | 24.0        | 22.5        | 25.0        | 26.0        | 26.5        | 23.0        | 17.5       | 12.0       | 11.0       | 21.0       | 25.0       | 25.5       |
| 10   | Turb (NTU)           | 1.2         | 1.4         | 1.5         | 1.8         | 1.6         | 2.0         | 0.4        | 0.5        | 0.7        | 0.8        | 1.0        | 1.1        |
|      | <b>CHEMICAL</b>      |             |             |             |             |             |             |            |            |            |            |            |            |
| 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        |
| 2    | ALK-TOT (mgCaCO3/L)  | 92          | 116         | 72          | 96          | 92          | 80          | 104        | 92         |            | 88         | 120        | 104        |
| 3    | B (mg/L)             | 0.04        | 0.04        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03       | 0.03       | 0.03       | 0.03       | 0.00       | 0.03       |
| 4    | Ca (mg/L)            | 22          | 26          | 19          | 22          | 21          | 19          | 26         | 21         | 22         | 19         | 26         | 21         |
| 5    | Cl (mg/L)            | 20.0        | 22.0        | 14.0        | 20.0        | 18.0        | 16.0        | 22.0       | 18.0       | 20.0       | 16.0       | 24.0       | 18.0       |
| 6    | 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        |
| 7    | F (mg/L)             | 0.32        | 0.40        | 0.32        | 0.36        | 0.30        | 0.24        | 0.28       | 0.22       | 0.24       | 0.24       | 0.30       | 0.26       |
| 8    | Fe (mg/L)            | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2        | 0.2        | 0.2        | 0.2        | 0.2        | 0.2        |
| 9    | HCO3 (mg/L)          | 112         | 142         | 88          | 117         | 112         | 98          | 127        | 112        | 117        | 107        | 146        | 127        |
| 10   | K (mg/L)             | 6.0         | 8.0         | 4.0         | 5.0         | 4.0         | 4.0         | 7.0        | 4.0        | 5.0        | 4.0        | 7.0        | 5.0        |
| 11   | Mg (mg/L)            | 12.9        | 14.6        | 9.8         | 13.7        | 11.7        | 10.7        | 12.7       | 9.8        | 11.7       | 9.8        | 13.7       | 10.7       |
| 12   | Na (mg/L)            | 12.0        | 14.0        | 10.0        | 12.0        | 11.0        | 10.0        | 16.0       | 14.0       | 12.0       | 10.0       | 16.0       | 12.0       |
| 13   | NH3-N (mg N/L)       | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |
| 14   | NO2+NO3 (mg N/L)     | 0.20        | 0.20        | 0.18        | 0.20        | 0.19        | 0.18        | 0.19       | 0.18       | 0.19       | 0.18       | 0.19       | 0.16       |
| 15   | NO2-N (mgN/L)        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |
| 16   | NO3-N (mgN/L)        | 0.20        | 0.20        | 0.18        | 0.20        | 0.19        | 0.18        | 0.19       | 0.18       | 0.19       | 0.18       | 0.19       | 0.16       |
| 17   | P-Tot (mgP/L)        | 0.018       | 0.020       | 0.016       | 0.018       | 0.016       | 0.014       | 0.018      | 0.012      | 0.014      | 0.010      | 0.014      | 0.012      |
| 18   | SiO2 (mg/L)          | 6.4         | 7.1         | 6.2         | 6.4         | 6.3         | 6.1         | 7.2        | 6.6        | 6.8        | 6.4        | 7.2        | 6.8        |
| 19   | SO4 (mg/L)           | 16.0        | 18.0        | 12.0        | 15.0        | 14.0        | 12.0        | 16.0       | 12.0       | 14.0       | 10.0       | 16.0       | 11.0       |

# Water Quality Datasheet for the period : 2015-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 01-06-2015 | 01-07-2015 | 01-08-2015 | 01-09-2015 | 01-10-2015 | 02-11-2015 | 01-12-2015 | 01-01-2016 | 01-02-2016 | 01-03-2016 | 01-04-2016 | 02-05-2016 |
|------|-----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|      |                                   | A          | A          | A          | A          | A          | A          | A          | A          | A          | A          | A          | A          |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |            |            |            |            |            |            |            |            |            |            |            |            |
| 1    | BOD3-27 (mg/L)                    | 2.9        | 2.7        | 2.2        | 2.6        | 2.7        | 2.2        | 1.0        | 2.9        | 2.7        | 1.8        | 2.6        | 2.7        |
| 2    | COD (mg/L)                        | 17.1       | 4.5        | 5.2        | 7.4        | 8.2        | 11.6       | 4.0        | 4.8        | 5.2        | 5.5        | 6.4        | 4.1        |
| 3    | DO (mg/L)                         | 6.7        | 6.5        | 7.3        | 7.5        | 7.3        | 6.9        | 7.3        | 5.9        | 7.8        | 7.8        | 7.5        | 7.3        |
| 4    | DO_SAT% (%)                       | 79         | 74         | 88         | 92         | 89         | 80         | 75         | 55         | 71         | 88         | 90         | 88         |
| 5    | FCol-MPN (MPN/100mL)              | 1400       | 1200       | 1000       | 900        | 1000       | 1200       | 1400       | 1200       | 1100       | 900        | 1100       | 1200       |
| 6    | Tcol-MPN (MPN/100mL)              | 3500       | 3200       | 2700       | 2600       | 2800       | 3000       | 3300       | 3100       | 3000       | 2700       | 3000       | 3400       |
|      | <b>TRACE &amp; TOXIC</b>          |            |            |            |            |            |            |            |            |            |            |            |            |
| 1    | As (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 9.5        |
| 2    | Cd (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 2.0        |
| 3    | Cr (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 7.0        |
| 4    | Ni (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 6.5        |
| 5    | Pb (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 8.5        |
| 6    | Zn (µg/L)                         |            |            |            |            |            |            |            |            |            |            |            | 7.5        |
|      | <b>CHEMICAL INDICES</b>           |            |            |            |            |            |            |            |            |            |            |            |            |
| 1    | HAR_Ca (mgCaCO3/L)                | 54         | 64         | 48         | 54         | 52         | 48         | 64         | 52         | 56         | 48         | 64         | 52         |
| 2    | HAR_Total (mgCaCO3/L)             | 108        | 125        | 89         | 111        | 101        | 93         | 117        | 93         | 105        | 89         | 121        | 97         |
| 3    | Na% (%)                           | 19         | 18         | 19         | 18         | 19         | 18         | 22         | 24         | 19         | 19         | 21         | 20         |
| 4    | RSC (-)                           | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.2        |
| 5    | SAR (-)                           | 0.5        | 0.5        | 0.5        | 0.5        | 0.5        | 0.5        | 0.6        | 0.6        | 0.5        | 0.5        | 0.6        | 0.5        |
|      | <b>PESTICIDES</b>                 |            |            |            |            |            |            |            |            |            |            |            |            |

# Water Quality Datasheet for the period : 2015-2016

Station Name : CHOPAN ( GGTOOL5)

Local River : Sone

Well Water Analysis

Division : M Ganga Div. III, Varanasi

Sub Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 02-11-2015 | 02-03-2016 |
|------|-----------------------------------|------------|------------|
|      |                                   | B          | B          |
|      | <b>PHYSICAL</b>                   |            |            |
| 1    | Colour_Cod (-)                    | Clear      | Clear      |
| 2    | EC_FLD (μmho/cm)                  | 1120       | 1080       |
| 3    | EC_GEN (μmho/cm)                  | 1104       | 1078       |
| 4    | Odour_Code (-)                    | odour free | odour free |
| 5    | pH_FLD (pH units)                 | 7.2        | 7.0        |
| 6    | pH_GEN (pH units)                 | 7.4        | 7.1        |
| 7    | TDS (mg/L)                        | 660        | 650        |
| 8    | Temp (deg C)                      | 24.5       | 24.5       |
|      | <b>CHEMICAL</b>                   |            |            |
| 1    | Alk-Phen (mgCaCO3/L)              | 0.0        | 0.0        |
| 2    | ALK-TOT (mgCaCO3/L)               | 224        | 216        |
| 3    | B (mg/L)                          | 0.03       | 0.03       |
| 4    | Ca (mg/L)                         | 45         | 42         |
| 5    | Cl (mg/L)                         | 130.0      | 120.0      |
| 6    | CO3 (mg/L)                        | 0.0        | 0.0        |
| 7    | F (mg/L)                          | 0.48       | 0.42       |
| 8    | Fe (mg/L)                         | 0.3        | 0.3        |
| 9    | HCO3 (mg/L)                       | 273        | 264        |
| 10   | K (mg/L)                          | 10.0       | 9.0        |
| 11   | Mg (mg/L)                         | 58.6       | 56.6       |
| 12   | Na (mg/L)                         | 82.0       | 78.0       |
| 13   | NH3-N (mg N/L)                    | 0.00       | 0.00       |
| 14   | NO2+NO3 (mg N/L)                  | 2.23       | 2.20       |
| 15   | NO2-N (mgN/L)                     | 0.00       | 0.00       |
| 16   | NO3-N (mgN/L)                     | 2.23       | 2.20       |
| 17   | P-Tot (mgP/L)                     | 0.024      | 0.020      |
| 18   | SiO2 (mg/L)                       | 8.4        | 8.1        |
| 19   | SO4 (mg/L)                        | 120.0      | 102.0      |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |            |            |
|      | <b>TRACE &amp; TOXIC</b>          |            |            |
|      | <b>CHEMICAL INDICES</b>           |            |            |
| 1    | HAR_Ca (mgCaCO3/L)                | 112        | 104        |
| 2    | HAR_Total (mgCaCO3/L)             | 356        | 340        |
| 3    | Na% (%)                           | 33         | 33         |
| 4    | RSC (-)                           | 0.0        | 0.0        |
| 5    | SAR (-)                           | 1.9        | 1.8        |
|      | <b>PESTICIDES</b>                 |            |            |

# Water Quality Summary for the period : 2015-2016

Station Name : CHOPAN ( GGTOOL5)

Division : M Ganga Div. III, Varanasi

Local River : Sone

Sub-Division : U Sone Rehand SD, Rewa

## River Water Summary

| S.No | Parameters                        | Number of Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|------------------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |                        |         |         |       |
| 1    | Q (cumec)                         | 366                    | 647.8   | 24.23   | 216.9 |
| 2    | EC_FLD (µmho/cm)                  | 12                     | 250     | 140     | 183   |
| 3    | EC_GEN (µmho/cm)                  | 12                     | 240     | 136     | 172   |
| 4    | pH_FLD (pH units)                 | 12                     | 7.9     | 7.0     | 7.5   |
| 5    | pH_GEN (pH units)                 | 12                     | 8.1     | 7.4     | 7.7   |
| 6    | TDS (mg/L)                        | 12                     | 144     | 84      | 103   |
| 7    | Temp (deg C)                      | 12                     | 26.5    | 11.0    | 21.6  |
| 8    | Turb (NTU)                        | 12                     | 2.0     | 0.4     | 1.2   |
|      | <b>CHEMICAL</b>                   |                        |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 11                     | 0.0     | 0.0     | 0     |
| 2    | ALK-TOT (mgCaCO3/L)               | 11                     | 120     | 72      | 96    |
| 3    | B (mg/L)                          | 12                     | 0.04    | 0.00    | 0.03  |
| 4    | Ca (mg/L)                         | 12                     | 26      | 19      | 22    |
| 5    | Cl (mg/L)                         | 12                     | 24.0    | 14.0    | 19    |
| 6    | CO3 (mg/L)                        | 12                     | 0.0     | 0.0     | 0     |
| 7    | F (mg/L)                          | 12                     | 0.40    | 0.22    | 0.29  |
| 8    | Fe (mg/L)                         | 12                     | 0.2     | 0.2     | 0.2   |
| 9    | HCO3 (mg/L)                       | 12                     | 146     | 88      | 117   |
| 10   | K (mg/L)                          | 12                     | 8.0     | 4.0     | 5.3   |
| 11   | Mg (mg/L)                         | 12                     | 14.6    | 9.8     | 11.8  |
| 12   | Na (mg/L)                         | 12                     | 16.0    | 10.0    | 12.4  |
| 13   | NH3-N (mg N/L)                    | 12                     | 0.00    | 0.00    | 0     |
| 14   | NO2+NO3 (mg N/L)                  | 12                     | 0.20    | 0.16    | 0.19  |
| 15   | NO2-N (mgN/L)                     | 12                     | 0.00    | 0.00    | 0     |
| 16   | NO3-N (mgN/L)                     | 12                     | 0.20    | 0.16    | 0.19  |
| 17   | o-PO4-P (mg P/L)                  | 2                      | 0.000   | 0.000   | 0     |
| 18   | P-Tot (mgP/L)                     | 12                     | 0.020   | 0.010   | 0.015 |
| 19   | SiO2 (mg/L)                       | 12                     | 7.2     | 6.1     | 6.6   |
| 20   | SO4 (mg/L)                        | 12                     | 18.0    | 10.0    | 13.8  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                        |         |         |       |
| 1    | BOD3-27 (mg/L)                    | 12                     | 2.9     | 1.0     | 2.4   |
| 2    | COD (mg/L)                        | 12                     | 17.1    | 4.0     | 7     |
| 3    | DO (mg/L)                         | 12                     | 7.8     | 5.9     | 7.1   |
| 4    | DO_SAT% (%)                       | 12                     | 92      | 55      | 81    |
| 5    | FCol-MPN (MPN/100mL)              | 12                     | 1400    | 900     | 1133  |
| 6    | Tcol-MPN (MPN/100mL)              | 12                     | 3500    | 2600    | 3025  |
|      | <b>TRACE &amp; TOXIC</b>          |                        |         |         |       |
| 1    | As (µg/L)                         | 1                      | 9.5     | 9.5     | 9.5   |
| 2    | Cd (µg/L)                         | 1                      | 2.0     | 2.0     | 2     |
| 3    | Cr (µg/L)                         | 1                      | 7.0     | 7.0     | 7     |
| 4    | Ni (µg/L)                         | 1                      | 6.5     | 6.5     | 6.5   |
| 5    | Pb (µg/L)                         | 1                      | 8.5     | 8.5     | 8.5   |
| 6    | Zn (µg/L)                         | 1                      | 7.5     | 7.5     | 7.5   |
|      | <b>CHEMICAL INDICES</b>           |                        |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 12                     | 64      | 48      | 55    |
| 2    | HAR_Total (mgCaCO3/L)             | 12                     | 125     | 89      | 104   |
| 3    | Na% (%)                           | 12                     | 24      | 18      | 20    |
| 4    | RSC (-)                           | 12                     | 0.2     | 0.0     | 0     |
| 5    | SAR (-)                           | 12                     | 0.6     | 0.5     | 0.5   |
|      | <b>PESTICIDES</b>                 |                        |         |         |       |

# Water Quality Summary for the period : 2015-2016

Station Name : CHOPAN ( GGTOOL5)

Division : M Ganga Div. III, Varanasi

Local River : Sone

Sub-Division : U Sone Rehand SD, Rewa

## Well Water Summary

| S.No | Parameters                        | Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|--------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |              |         |         |       |
| 1    | EC_FLD (μmho/cm)                  | 2            | 1120    | 1080    | 1100  |
| 2    | EC_GEN (μmho/cm)                  | 2            | 1104    | 1078    | 1091  |
| 3    | pH_FLD (pH units)                 | 2            | 7.2     | 7.0     | 7.1   |
| 4    | pH_GEN (pH units)                 | 2            | 7.4     | 7.1     | 7.2   |
| 5    | TDS (mg/L)                        | 2            | 660     | 650     | 655   |
| 6    | Temp (deg C)                      | 2            | 24.5    | 24.5    | 24.5  |
|      | <b>CHEMICAL</b>                   |              |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 2            | 0.0     | 0.0     | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)               | 2            | 224     | 216     | 220   |
| 3    | B (mg/L)                          | 2            | 0.03    | 0.03    | 0.03  |
| 4    | Ca (mg/L)                         | 2            | 45      | 42      | 43    |
| 5    | Cl (mg/L)                         | 2            | 130.0   | 120.0   | 125.0 |
| 6    | CO3 (mg/L)                        | 2            | 0.0     | 0.0     | 0.0   |
| 7    | F (mg/L)                          | 2            | 0.48    | 0.42    | 0.45  |
| 8    | Fe (mg/L)                         | 2            | 0.3     | 0.3     | 0.3   |
| 9    | HCO3 (mg/L)                       | 2            | 273     | 264     | 268   |
| 10   | K (mg/L)                          | 2            | 10.0    | 9.0     | 9.5   |
| 11   | Mg (mg/L)                         | 2            | 58.6    | 56.6    | 57.6  |
| 12   | Na (mg/L)                         | 2            | 82.0    | 78.0    | 80.0  |
| 13   | NH3-N (mg N/L)                    | 2            | 0.00    | 0.00    | 0.00  |
| 14   | NO2+NO3 (mg N/L)                  | 2            | 2.23    | 2.20    | 2.21  |
| 15   | NO2-N (mgN/L)                     | 2            | 0.00    | 0.00    | 0.00  |
| 16   | NO3-N (mgN/L)                     | 2            | 2.23    | 2.20    | 2.21  |
| 17   | P-Tot (mgP/L)                     | 2            | 0.024   | 0.020   | 0.022 |
| 18   | SiO2 (mg/L)                       | 2            | 8.4     | 8.1     | 8.3   |
| 19   | SO4 (mg/L)                        | 2            | 120.0   | 102.0   | 111.0 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |              |         |         |       |
|      | <b>TRACE &amp; TOXIC</b>          |              |         |         |       |
|      | <b>CHEMICAL INDICES</b>           |              |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 2            | 112     | 104     | 108   |
| 2    | HAR_Total (mgCaCO3/L)             | 2            | 356     | 340     | 348   |
| 3    | Na% (%)                           | 2            | 33      | 33      | 33    |
| 4    | RSC (-)                           | 2            | 0.0     | 0.0     | 0.0   |
| 5    | SAR (-)                           | 2            | 1.9     | 1.8     | 1.9   |
|      | <b>PESTICIDES</b>                 |              |         |         |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Flood<br>Jun - Oct |       |       |       |       |       |       |       |       |       | Wier<br>Nov |           |           |           |           |
|------|----------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-----------|-----------|-----------|-----------|
|      |                      | 2006               | 2007  | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2006-2007   | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>PHYSICAL</b>      |                    |       |       |       |       |       |       |       |       |       |             |           |           |           |           |
| 1    | Q (cumec)            | 1121               | 427.3 | 393.5 | 336.7 | 370.2 | 692.7 | 538.1 | 700.2 | 305.2 | 269.6 | 382.8       | 77.03     | 197.7     | 129.3     | 148.7     |
| 2    | EC_FLD (µmho/cm)     | 186                | 150   | 168   | 180   | 174   | 181   | 151   | 203   | 205   | 182   | 204         | 150       | 181       | 154       | 176       |
| 3    | EC_GEN (µmho/cm)     | 174                | 139   | 158   | 177   | 170   | 175   | 146   | 202   | 199   | 164   | 144         | 136       | 170       | 152       | 171       |
| 4    | pH_FLD (pH units)    | 8.1                | 8.0   | 8.0   | 7.9   | 8.1   | 8.6   | 7.8   | 7.9   | 8.0   | 7.5   | 8.0         | 8.1       | 7.9       | 8.0       | 8.2       |
| 5    | pH_GEN (pH units)    | 8.4                | 8.4   | 8.3   | 8.0   | 8.4   | 8.7   | 7.9   | 8.1   | 8.1   | 7.7   | 8.6         | 8.3       | 8.2       | 8.1       | 8.5       |
| 6    | TDS (mg/L)           |                    |       |       | 93    | 117   | 92    | 105   | 124   | 121   | 99    |             |           |           | 83        | 105       |
| 7    | Temp (deg C)         | 27.9               | 27.3  | 27.8  | 26.8  | 27.3  | 27.6  | 27.7  | 26.4  | 26.6  | 24.8  | 22.9        | 20.3      | 21.8      | 21.1      | 22.6      |
| 8    | Turb (NTU)           |                    |       |       | 0.6   | 2.4   | 2.4   | 0.4   | 2.2   | 2.1   | 1.5   |             |           |           | 0.1       | 0.3       |
|      | <b>CHEMICAL</b>      |                    |       |       |       |       |       |       |       |       |       |             |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L) | 6.4                | 19.9  | 6.0   | 0.0   | 19.9  | 23.9  | 0.0   | 3.3   | 0.0   | 0.0   | 5.0         | 19.9      | 0.0       | 2.0       | 10.0      |
| 2    | ALK-TOT (mgCaCO3/L)  | 120                | 110   | 93    | 113   | 126   | 128   | 92    | 98    | 92    | 94    | 152         | 125       | 115       | 100       | 105       |
| 3    | B (mg/L)             | 0.00               | 0.00  | 0.02  | 0.00  | 0.00  | 0.00  | 0.01  | 0.02  | 0.01  | 0.03  | 0.03        | 0.00      | 0.01      | 0.00      | 0.03      |
| 4    | Ca (mg/L)            | 16                 | 27    | 23    | 21    | 29    | 31    | 33    | 33    | 30    | 22    | 14          | 32        | 34        | 22        | 28        |
| 5    | Cl (mg/L)            | 17.4               | 26.8  | 28.8  | 39.0  | 18.0  | 19.4  | 27.4  | 26.4  | 25.0  | 18.8  | 28.5        | 25.0      | 31.3      | 41.8      | 20.0      |
| 6    | CO3 (mg/L)           | 7.7                | 24.0  | 7.2   | 0.0   | 24.0  | 28.8  | 0.0   | 4.0   | 0.0   | 0.0   | 6.0         | 24.0      | 0.0       | 2.4       | 12.0      |
| 7    | F (mg/L)             | 0.21               | 0.11  | 0.23  | 0.41  | 0.63  | 0.39  | 0.48  | 0.51  | 0.35  | 0.34  | 0.05        | 0.05      | 0.16      | 0.15      | 0.37      |
| 8    | Fe (mg/L)            | 0.0                | 0.2   | 0.0   | 0.2   | 0.3   | 0.1   | 0.2   | 0.2   | 0.2   | 0.2   | 0.1         | 0.2       | 0.2       | 0.2       | 0.3       |
| 9    | HCO3 (mg/L)          | 79                 | 72    | 99    | 138   | 105   | 98    | 112   | 111   | 113   | 114   | 100         | 68        | 140       | 117       | 103       |
| 10   | K (mg/L)             | 1.8                | 8.8   | 6.8   | 5.2   | 5.4   | 6.8   | 6.2   | 8.2   | 7.4   | 5.4   | 4.5         | 9.8       | 5.5       | 2.7       | 6.5       |
| 11   | Mg (mg/L)            | 5.5                | 18.0  | 12.2  | 12.1  | 17.6  | 18.8  | 20.4  | 19.3  | 17.8  | 12.5  | 16.4        | 18.9      | 13.2      | 10.9      | 17.1      |
| 12   | Na (mg/L)            | 4.6                | 21.2  | 19.2  | 28.7  | 12.2  | 13.0  | 15.6  | 16.0  | 14.2  | 11.8  | 13.3        | 24.8      | 21.4      | 33.0      | 13.8      |
| 13   | NH3-N (mg N/L)       | 0.05               | 0.05  | 0.05  | 0.08  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  | 0.05        | 0.05      | 0.05      | 0.05      | 0.05      |
| 14   | NO2+NO3 (mg N/L)     | 0.98               | 0.03  | 0.06  | 0.08  | 0.19  | 0.25  | 0.30  | 0.29  | 0.27  | 0.19  | 0.12        | 0.02      | 0.25      | 0.07      | 0.42      |
| 15   | NO2-N (mgN/L)        | 0.01               | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.02        | 0.01      | 0.01      | 0.00      | 0.00      |
| 16   | NO3-N (mgN/L)        | 0.97               | 0.03  | 0.06  | 0.07  | 0.19  | 0.25  | 0.30  | 0.29  | 0.27  | 0.19  | 0.10        | 0.01      | 0.23      | 0.07      | 0.42      |
| 17   | P-Tot (mgP/L)        | 0.003              | 0.004 | 0.001 | 0.009 | 0.004 | 0.002 | 0.001 | 0.001 | 0.022 | 0.018 | 0.010       | 0.001     | 0.009     | 0.008     | 0.016     |
| 18   | SiO2 (mg/L)          | 11.5               | 8.8   | 7.1   | 8.0   | 7.9   | 7.8   | 8.5   | 8.3   | 7.8   | 6.5   | 9.1         | 8.7       | 9.4       | 6.7       | 7.9       |
| 19   | SO4 (mg/L)           | 13.8               | 6.8   | 15.7  | 10.6  | 17.6  | 11.2  | 13.4  | 13.8  | 13.8  | 15.0  | 16.3        | 7.8       | 20.0      | 11.9      | 26.0      |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood     |      |      |      |      |      |      |      |      |      | Wier      |           |           |           |           |
|------|-----------------------------------|-----------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                                   | Jun - Oct |      |      |      |      |      |      |      |      |      | Nov       |           |           |           |           |
|      |                                   | 2006      | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | BOD3-27 (mg/L)                    |           |      |      | 2.3  | 2.8  | 2.3  | 2.5  | 2.9  | 2.9  | 2.6  |           |           |           | 2.2       | 2.9       |
| 2    | COD (mg/L)                        |           | 3.5  |      | 5.6  | 10.0 | 12.0 | 10.3 | 8.9  | 13.9 | 8.5  | 3.5       |           |           | 6.4       | 8.3       |
| 3    | DO (mg/L)                         | 7.3       | 7.3  | 7.2  | 7.3  | 7.2  | 7.5  | 7.2  | 7.2  | 7.3  | 7.0  | 7.6       | 7.4       | 7.4       | 7.4       | 7.5       |
| 4    | DO_SAT% (%)                       | 92        | 92   | 92   | 91   | 91   | 95   | 91   | 89   | 90   | 84   | 88        | 81        | 83        | 83        | 87        |
| 5    | FCol-MPN (MPN/100mL)              |           | 380  | 275  | 1220 | 480  | 720  | 740  | 900  | 1180 | 1100 | 250       | 325       | 525       | 3675      | 500       |
| 6    | Tcol-MPN (MPN/100mL)              |           | 1040 | 1025 | 2520 | 1400 | 2060 | 2280 | 2280 | 2440 | 2960 | 550       | 950       | 1575      | 6175      | 1475      |
|      | <b>TRACE &amp; TOXIC</b>          |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | As (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 2    | Cd (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 3    | Cr (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 4    | Ni (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 5    | Pb (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 6    | Zn (µg/L)                         |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
|      | <b>CHEMICAL INDICES</b>           |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)                | 39        | 69   | 58   | 53   | 73   | 78   | 83   | 84   | 76   | 55   | 35        | 80        | 84        | 55        | 71        |
| 2    | HAR_Total (mgCaCO3/L)             | 62        | 143  | 109  | 104  | 147  | 156  | 168  | 164  | 150  | 107  | 103       | 159       | 139       | 100       | 143       |
| 3    | Na% (%)                           | 13        | 23   | 27   | 36   | 15   | 15   | 16   | 17   | 16   | 19   | 20        | 24        | 24        | 41        | 17        |
| 4    | RSC (-)                           | 0.4       | 0.0  | 0.0  | 0.2  | 0.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.1       | 0.0       | 0.0       | 0.1       | 0.0       |
| 5    | SAR (-)                           | 0.2       | 0.8  | 0.8  | 1.2  | 0.4  | 0.5  | 0.5  | 0.5  | 0.5  | 0.5  | 0.6       | 0.9       | 0.8       | 1.4       | 0.5       |
|      | <b>PESTICIDES</b>                 |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Winter    |           |           |           |           | Summer    |       |       |       |       |       |       |       |       |       |  |
|------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|      |                      | Jan - Feb |           |           |           |           | Mar - May |       |       |       |       |       |       |       |       |       |  |
|      |                      | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  |  |
|      | PHYSICAL             |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |  |
| 1    | Q (cumec)            | 287.1     | 431.4     | 309.9     | 252.1     | 161.6     | 172.2     | 126.8 | 104.5 | 128.8 | 107.0 | 307.9 | 228.2 | 202.1 | 184.1 | 127.8 |  |
| 2    | EC_FLD (µmho/cm)     | 198       | 215       | 233       | 248       | 175       | 188       | 187   | 197   | 166   | 180   | 211   | 235   | 249   | 220   | 193   |  |
| 3    | EC_GEN (µmho/cm)     | 195       | 206       | 225       | 241       | 169       | 143       | 162   | 184   | 162   | 175   | 205   | 229   | 241   | 215   | 188   |  |
| 4    | pH_FLD (pH units)    | 8.6       | 8.0       | 7.8       | 8.0       | 7.4       | 7.9       | 7.9   | 7.9   | 8.2   | 8.3   | 8.6   | 8.3   | 8.0   | 7.8   | 7.6   |  |
| 5    | pH_GEN (pH units)    | 8.7       | 8.3       | 7.9       | 8.1       | 7.7       | 8.3       | 8.9   | 8.2   | 8.3   | 8.6   | 8.7   | 8.5   | 8.1   | 7.9   | 7.8   |  |
| 6    | TDS (mg/L)           | 96        | 141       | 142       | 140       | 102       |           |       |       | 87    | 115   | 97    | 141   | 144   | 134   | 114   |  |
| 7    | Temp (deg C)         | 24.1      | 19.4      | 18.4      | 18.3      | 15.9      | 24.7      | 23.0  | 23.7  | 22.5  | 25.7  | 24.0  | 20.3  | 22.5  | 19.5  | 23.8  |  |
| 8    | Turb (NTU)           | 0.1       | 0.2       | 0.3       | 1.9       | 0.9       |           |       |       | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0.3   | 1.0   |  |
|      | CHEMICAL             |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |  |
| 1    | Alk-Phen (mgCaCO3/L) | 34.9      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 19.9  | 0.0   | 10.6  | 15.5  | 33.2  | 0.0   | 0.0   | 0.0   | 0.0   |  |
| 2    | ALK-TOT (mgCaCO3/L)  | 160       | 91        | 87        | 105       | 92        | 193       | 96    | 133   | 145   | 122   | 159   | 93    | 92    | 103   | 104   |  |
| 3    | B (mg/L)             | 0.03      | 0.03      | 0.04      | 0.02      | 0.03      | 0.02      |       | 0.01  | 0.00  | 0.04  | 0.04  | 0.04  | 0.04  | 0.04  | 0.02  |  |
| 4    | Ca (mg/L)            | 32        | 33        | 33        | 30        | 22        | 14        | 32    | 37    | 34    | 27    | 32    | 32    | 34    | 29    | 22    |  |
| 5    | Cl (mg/L)            | 22.5      | 25.3      | 22.5      | 26.2      | 19.0      | 20.0      | 24.3  | 58.3  | 45.4  | 21.3  | 26.0  | 26.7  | 26.7  | 24.3  | 19.3  |  |
| 6    | CO3 (mg/L)           | 42.0      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 24.0  | 0.0   | 12.8  | 18.7  | 40.0  | 0.0   | 0.0   | 0.0   | 0.0   |  |
| 7    | F (mg/L)             | 0.39      | 0.40      | 0.38      | 0.37      | 0.24      | 0.13      |       | 0.05  | 0.28  | 0.26  | 0.35  | 0.34  | 0.38  | 0.35  | 0.27  |  |
| 8    | Fe (mg/L)            | 0.2       | 0.2       | 0.2       | 0.2       | 0.2       | 0.1       |       | 0.2   | 0.2   | 0.1   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   |  |
| 9    | HCO3 (mg/L)          | 110       | 111       | 106       | 128       | 113       | 118       | 68    | 162   | 151   | 111   | 112   | 114   | 112   | 125   | 127   |  |
| 10   | K (mg/L)             | 6.5       | 6.0       | 6.3       | 7.0       | 5.0       | 8.7       | 8.0   | 3.9   | 3.9   | 7.0   | 7.0   | 7.3   | 6.3   | 7.7   | 5.3   |  |
| 11   | Mg (mg/L)            | 19.4      | 20.2      | 19.7      | 18.5      | 11.2      | 12.6      | 18.8  | 12.1  | 12.5  | 21.2  | 19.8  | 19.9  | 20.0  | 16.9  | 11.4  |  |
| 12   | Na (mg/L)            | 14.5      | 14.5      | 15.0      | 14.2      | 13.0      | 19.7      | 23.7  | 41.8  | 35.9  | 14.0  | 15.0  | 13.0  | 16.0  | 15.0  | 12.7  |  |
| 13   | NH3-N (mg N/L)       | 0.05      | 0.05      | 1.29      | 0.00      | 0.00      | 0.05      |       | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |  |
| 14   | NO2+NO3 (mg N/L)     | 0.24      | 0.26      | 0.26      | 0.28      | 0.18      | 0.12      |       | 0.05  | 0.04  | 0.36  | 0.35  | 0.32  | 0.26  | 0.22  | 0.18  |  |
| 15   | NO2-N (mgN/L)        | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |       | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |  |
| 16   | NO3-N (mgN/L)        | 0.24      | 0.26      | 0.26      | 0.28      | 0.18      | 0.12      |       | 0.05  | 0.04  | 0.36  | 0.35  | 0.32  | 0.26  | 0.22  | 0.18  |  |
| 17   | P-Tot (mgP/L)        | 0.005     | 0.007     | 0.008     | 0.018     | 0.015     | 0.009     |       | 0.015 | 0.001 | 0.007 | 0.001 | 0.001 | 0.008 | 0.019 | 0.012 |  |
| 18   | SiO2 (mg/L)          | 8.2       | 7.7       | 8.3       | 7.2       | 6.7       | 7.5       |       | 9.3   | 7.5   | 8.2   | 8.5   | 8.5   | 8.4   | 7.1   | 6.8   |  |
| 19   | SO4 (mg/L)           | 11.0      | 13.5      | 11.5      | 15.7      | 13.5      | 10.7      | 8.7   | 8.3   | 10.2  | 15.3  | 14.0  | 13.0  | 14.7  | 20.0  | 12.3  |  |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                 | Winter    |           |           |           |           | Summer    |      |      |      |      |      |      |      |      |      |  |
|------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|------|------|--|
|      |                            | Jan - Feb |           |           |           |           | Mar - May |      |      |      |      |      |      |      |      |      |  |
|      |                            | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |  |
|      | BIOLOGICAL/BACTERIOLOGICAL |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |  |
| 1    | BOD3-27 (mg/L)             | 2.6       | 2.6       | 2.7       | 2.9       | 2.2       |           |      |      | 1.9  | 2.4  | 2.2  | 2.5  | 2.6  | 2.8  | 2.3  |  |
| 2    | COD (mg/L)                 | 8.7       | 12.2      | 9.8       | 14.0      | 6.4       | 2.5       |      |      | 9.6  | 9.1  | 10.0 | 10.7 | 11.3 | 15.9 | 5.3  |  |
| 3    | DO (mg/L)                  | 7.6       | 7.7       | 7.7       | 7.1       | 7.0       | 7.6       | 7.6  | 7.6  | 7.1  | 7.5  | 7.4  | 7.6  | 7.7  | 7.4  | 7.5  |  |
| 4    | DO_SAT% (%)                | 91        | 83        | 81        | 75        | 70        | 91        | 88   | 89   | 82   | 92   | 88   | 84   | 88   | 80   | 89   |  |
| 5    | FCol-MPN (MPN/100mL)       | 525       | 825       | 1050      | 800       | 1225      | 233       | 100  | 333  | 2700 | 700  | 800  | 867  | 1300 | 1067 | 1067 |  |
| 6    | Tcol-MPN (MPN/100mL)       | 2000      | 2100      | 2275      | 2125      | 3100      | 967       | 600  | 1533 | 8533 | 2300 | 2400 | 2233 | 2600 | 2800 | 3033 |  |
|      | TRACE & TOXIC              |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |  |
| 1    | As (µg/L)                  |           |           |           |           |           |           |      |      |      | 18.0 | 20.0 | 23.0 | 19.0 | 17.0 | 9.5  |  |
| 2    | Cd (µg/L)                  |           |           |           |           |           |           |      |      |      | 5.0  | 2.6  | 2.5  | 1.8  | 2.0  | 2.0  |  |
| 3    | Cr (µg/L)                  |           |           |           |           |           |           |      |      |      | 8.0  | 13.0 | 10.5 | 12.3 | 11.0 | 7.0  |  |
| 4    | Ni (µg/L)                  |           |           |           |           |           |           |      |      |      | 20.0 | 6.0  | 14.0 | 9.0  | 11.0 | 6.5  |  |
| 5    | Pb (µg/L)                  |           |           |           |           |           |           |      |      |      | 58.0 | 7.0  | 9.0  | 7.2  | 8.0  | 8.5  |  |
| 6    | Zn (µg/L)                  |           |           |           |           |           |           |      |      |      | 7.0  | 9.0  | 10.0 | 8.8  | 10.0 | 7.5  |  |
|      | CHEMICAL INDICES           |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |  |
| 1    | HAR_Ca (mgCaCO3/L)         | 80        | 82        | 83        | 75        | 55        | 36        | 79   | 92   | 84   | 67   | 81   | 81   | 86   | 72   | 55   |  |
| 2    | HAR_Total (mgCaCO3/L)      | 160       | 167       | 165       | 152       | 102       | 88        | 157  | 142  | 136  | 156  | 164  | 164  | 169  | 142  | 102  |  |
| 3    | Na% (%)                    | 16        | 15        | 16        | 16        | 21        | 30        | 24   | 38   | 36   | 16   | 16   | 14   | 16   | 18   | 20   |  |
| 4    | RSC (-)                    | 0.1       | 0.0       | 0.0       | 0.0       | 0.0       | 0.2       | 0.0  | 0.0  | 0.3  | 0.0  | 0.1  | 0.0  | 0.0  | 0.0  | 0.1  |  |
| 5    | SAR (-)                    | 0.5       | 0.5       | 0.5       | 0.5       | 0.6       | 0.9       | 0.8  | 1.5  | 1.4  | 0.5  | 0.5  | 0.4  | 0.5  | 0.5  | 0.5  |  |
|      | PESTICIDES                 |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |  |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood     |       |       |       |       |      |      |      |      |      | Wier      |           |           |           |           |
|------|-----------------------------------|-----------|-------|-------|-------|-------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                                   | Jun - Oct |       |       |       |       |      |      |      |      |      | Nov       |           |           |           |           |
|      |                                   | 2006      | 2007  | 2008  | 2009  | 2010  | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>PHYSICAL</b>                   |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
| 1    | EC_FLD (µmho/cm)                  | 1034      | 950   | 1128  | 962   | 992   |      |      |      |      |      | 1033      | 900       | 993       | 688       | 920       |
| 2    | EC_GEN (µmho/cm)                  | 1009      | 912   | 1119  | 958   | 987   |      |      |      |      |      | 1011      | 894       | 983       | 685       | 916       |
| 3    | pH_FLD (pH units)                 | 7.4       | 7.9   | 7.1   | 7.7   | 7.5   |      |      |      |      |      | 8.0       | 8.4       | 7.1       | 7.8       | 7.8       |
| 4    | pH_GEN (pH units)                 | 7.9       | 8.3   | 7.7   | 7.8   | 7.8   |      |      |      |      |      | 8.2       | 8.5       | 7.9       | 7.9       | 8.0       |
| 5    | TDS (mg/L)                        |           |       |       | 575   | 564   |      |      |      |      |      |           |           |           | 383       | 518       |
| 6    | Temp (deg C)                      | 27.2      | 28.4  | 25.7  | 26.4  | 25.4  |      |      |      |      |      | 26.9      | 24.0      | 25.3      | 20.6      | 25.8      |
|      | <b>CHEMICAL</b>                   |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L)              | 10.4      | 29.5  | 0.0   | 0.0   | 1.3   |      |      |      |      |      | 8.0       | 0.0       | 0.0       | 0.0       | 0.0       |
| 2    | ALK-TOT (mgCaCO3/L)               | 354       | 214   | 201   | 211   | 130   |      |      |      |      |      | 454       | 392       | 206       | 237       | 117       |
| 3    | B (mg/L)                          | 0.00      | 0.03  | 0.00  | 0.06  | 0.05  |      |      |      |      |      | 0.01      | 0.00      | 0.00      | 0.05      | 0.03      |
| 4    | Ca (mg/L)                         | 43        | 64    | 58    | 49    | 45    |      |      |      |      |      | 53        | 65        | 50        | 37        | 45        |
| 5    | Cl (mg/L)                         | 93.2      | 139.6 | 107.4 | 80.7  | 117.6 |      |      |      |      |      | 88.0      | 140.0     | 108.2     | 63.4      | 118.0     |
| 6    | CO3 (mg/L)                        | 12.5      | 35.5  | 0.0   | 0.0   | 1.6   |      |      |      |      |      | 9.6       | 0.0       | 0.0       | 0.0       | 0.0       |
| 7    | F (mg/L)                          | 0.05      | 0.32  | 0.16  | 0.38  | 0.72  |      |      |      |      |      | 0.10      | 0.05      | 0.14      | 0.16      | 0.50      |
| 8    | Fe (mg/L)                         | 0.0       | 0.3   | 0.0   | 0.1   | 0.5   |      |      |      |      |      | 0.0       | 0.4       | 0.1       | 0.1       | 0.4       |
| 9    | HCO3 (mg/L)                       | 230       | 189   | 245   | 258   | 156   |      |      |      |      |      | 267       | 274       | 251       | 290       | 143       |
| 10   | K (mg/L)                          | 6.6       | 14.0  | 15.1  | 6.3   | 6.0   |      |      |      |      |      | 20.8      | 14.3      | 10.1      | 4.7       | 6.5       |
| 11   | Mg (mg/L)                         | 40.8      | 57.9  | 41.2  | 52.6  | 61.0  |      |      |      |      |      | 36.4      | 60.8      | 39.7      | 45.4      | 59.4      |
| 12   | Na (mg/L)                         | 59.8      | 67.4  | 62.6  | 44.7  | 62.4  |      |      |      |      |      | 89.3      | 66.0      | 63.3      | 47.0      | 65.0      |
| 13   | NH3-N (mg N/L)                    | 0.05      | 0.05  | 0.05  | 0.05  | 0.05  |      |      |      |      |      | 0.05      | 0.05      | 0.05      | 0.05      | 0.05      |
| 14   | NO2+NO3 (mg N/L)                  | 1.67      | 7.29  | 5.45  | 6.93  | 4.03  |      |      |      |      |      | 4.59      | 8.34      | 5.24      | 6.10      | 3.27      |
| 15   | NO2-N (mgN/L)                     | 0.01      | 0.02  | 0.45  | 0.00  | 0.02  |      |      |      |      |      | 0.03      | 0.03      | 0.03      | 0.00      | 0.03      |
| 16   | NO3-N (mgN/L)                     | 1.65      | 7.27  | 5.00  | 6.93  | 4.01  |      |      |      |      |      | 4.57      | 8.31      | 5.21      | 6.10      | 3.24      |
| 17   | P-Tot (mgP/L)                     | 0.003     | 0.012 | 0.001 | 0.023 | 0.001 |      |      |      |      |      | 0.009     | 0.001     | 0.021     | 0.021     | 0.001     |
| 18   | SiO2 (mg/L)                       | 12.1      | 11.8  | 9.1   | 8.2   | 10.1  |      |      |      |      |      | 13.2      | 9.5       | 9.3       | 14.0      | 8.3       |
| 19   | SO4 (mg/L)                        | 65.2      | 57.4  | 81.4  | 91.2  | 144.6 |      |      |      |      |      | 73.0      | 59.0      | 42.6      | 57.6      | 126.3     |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |
|      | <b>TRACE &amp; TOXIC</b>          |           |       |       |       |       |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Flood     |      |      |      |      |      |      |      |      |      | Wier      |           |           |           |           |
|------|-------------------------|-----------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                         | Jun - Oct |      |      |      |      |      |      |      |      |      | Nov       |           |           |           |           |
|      |                         | 2006      | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>CHEMICAL INDICES</b> |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)      | 107       | 160  | 144  | 122  | 112  |      |      |      |      |      | 133       | 161       | 126       | 93        | 113       |
| 2    | HAR_Total (mgCaCO3/L)   | 277       | 402  | 315  | 341  | 366  |      |      |      |      |      | 285       | 415       | 291       | 282       | 360       |
| 3    | Na% (%)                 | 32        | 26   | 29   | 22   | 27   |      |      |      |      |      | 39        | 25        | 31        | 26        | 28        |
| 4    | RSC (-)                 | 0.3       | 0.0  | 0.0  | 0.0  | 0.0  |      |      |      |      |      | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       |
| 5    | SAR (-)                 | 1.6       | 1.5  | 1.5  | 1.1  | 1.4  |      |      |      |      |      | 2.3       | 1.4       | 1.6       | 1.2       | 1.5       |
|      | <b>PESTICIDES</b>       |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Winter    |           |           |           |           | Summer    |       |       |       |       |       |       |       |       |       |
|------|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |                                   | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | Mar - May |       |       |       |       |       |       |       |       |       |
|      |                                   | 2007      | 2008      | 2009      | 2010      | 2011      | 2012      | 2013  | 2014  | 2015  | 2016  |       |       |       |       |       |
|      | <b>PHYSICAL</b>                   |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |
| 1    | EC_FLD (µmho/cm)                  | 835       | 1020      | 1006      | 1050      | 1120      | 1087      | 1132  | 990   | 1007  | 920   | 895   | 995   | 1054  | 910   | 1080  |
| 2    | EC_GEN (µmho/cm)                  | 820       | 1012      | 988       | 1028      | 1104      | 1061      | 1100  | 980   | 1001  | 912   | 886   | 982   | 1042  | 903   | 1078  |
| 3    | pH_FLD (pH units)                 | 8.0       | 8.5       | 8.2       | 8.3       | 7.2       | 7.0       | 7.7   | 7.2   | 8.2   | 8.0   | 8.0   | 8.6   | 8.3   | 8.0   | 7.0   |
| 4    | pH_GEN (pH units)                 | 8.0       | 8.6       | 8.5       | 8.4       | 7.4       | 7.4       | 8.0   | 8.0   | 8.3   | 8.3   | 8.1   | 8.8   | 8.6   | 8.0   | 7.1   |
| 5    | TDS (mg/L)                        | 510       | 568       | 496       | 590       | 660       |           |       |       | 500   | 512   | 518   | 576   | 512   | 542   | 650   |
| 6    | Temp (deg C)                      | 26.5      | 26.0      | 24.0      | 21.0      | 24.5      | 27.7      | 24.7  | 24.3  | 22.0  | 27.0  | 25.0  | 25.0  | 26.5  | 25.0  | 24.5  |
|      | <b>CHEMICAL</b>                   |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0   | 0.0   | 19.9  | 6.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)               | 76        | 76        | 96        | 176       | 224       | 407       | 212   | 227   | 227   | 131   | 84    | 84    | 109   | 152   | 216   |
| 3    | B (mg/L)                          | 0.04      | 0.04      | 0.05      | 0.03      | 0.03      | 0.00      |       | 0.03  | 0.04  | 0.00  | 0.02  | 0.02  | 0.06  | 0.03  | 0.03  |
| 4    | Ca (mg/L)                         | 43        | 45        | 46        | 43        | 45        | 76        | 62    | 63    | 42    | 52    | 52    | 50    | 51    | 37    | 42    |
| 5    | Cl (mg/L)                         | 130.0     | 130.0     | 88.0      | 132.0     | 130.0     | 86.0      | 139.3 | 110.9 | 68.3  | 126.0 | 140.0 | 136.0 | 96.0  | 120.0 | 120.0 |
| 6    | CO3 (mg/L)                        | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0   | 0.0   | 24.0  | 8.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 7    | F (mg/L)                          | 0.51      | 0.52      | 0.44      | 0.44      | 0.48      | 0.06      |       | 0.06  | 0.05  | 0.56  | 0.55  | 0.58  | 0.52  | 0.40  | 0.42  |
| 8    | Fe (mg/L)                         | 0.3       | 0.3       | 0.3       | 0.3       | 0.3       | 0.1       |       | 0.1   | 0.4   | 0.5   | 0.5   | 0.5   | 0.4   | 0.3   | 0.3   |
| 9    | HCO3 (mg/L)                       | 93        | 93        | 117       | 215       | 273       | 248       | 259   | 277   | 229   | 143   | 102   | 102   | 133   | 185   | 264   |
| 10   | K (mg/L)                          | 10.0      | 10.0      | 16.0      | 12.1      | 10.0      | 15.3      | 12.7  | 9.8   | 3.0   | 8.0   | 15.0  | 8.0   | 21.0  | 9.0   | 9.0   |
| 11   | Mg (mg/L)                         | 60.9      | 59.4      | 35.4      | 59.0      | 58.6      | 47.7      | 60.0  | 56.2  | 53.0  | 70.2  | 74.4  | 74.4  | 40.1  | 53.7  | 56.6  |
| 12   | Na (mg/L)                         | 68.0      | 66.0      | 42.0      | 88.0      | 82.0      | 68.3      | 70.0  | 61.1  | 54.3  | 67.0  | 84.0  | 64.0  | 55.0  | 76.0  | 78.0  |
| 13   | NH3-N (mg N/L)                    | 0.05      | 0.05      | 0.05      | 0.00      | 0.00      | 0.06      |       | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |
| 14   | NO2+NO3 (mg N/L)                  | 2.32      | 2.34      | 1.99      | 2.33      | 2.23      | 7.94      |       | 6.80  | 5.48  | 3.62  | 3.57  | 3.57  | 2.00  | 2.10  | 2.20  |
| 15   | NO2-N (mgN/L)                     | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      | 0.04      |       | 0.05  | 0.01  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| 16   | NO3-N (mgN/L)                     | 2.32      | 2.34      | 1.99      | 2.33      | 2.23      | 7.90      |       | 6.76  | 5.47  | 3.62  | 3.57  | 3.57  | 2.00  | 2.10  | 2.20  |
| 17   | P-Tot (mgP/L)                     | 0.001     | 0.001     | 0.003     | 0.026     | 0.024     | 0.013     |       | 0.024 | 0.001 | 0.001 | 0.001 | 0.001 | 0.012 | 0.020 | 0.020 |
| 18   | SiO2 (mg/L)                       | 8.1       | 5.1       | 7.2       | 8.1       | 8.4       | 16.3      |       | 8.3   | 11.9  | 8.9   | 8.7   | 5.5   | 8.2   | 7.8   | 8.1   |
| 19   | SO4 (mg/L)                        | 138.0     | 132.0     | 90.0      | 128.2     | 120.0     | 82.3      | 64.0  | 95.7  | 97.3  | 149.0 | 146.0 | 140.0 | 82.0  | 110.0 | 102.0 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |
|      | <b>TRACE &amp; TOXIC</b>          |           |           |           |           |           |           |       |       |       |       |       |       |       |       |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : CHOPAN ( GGTOOLS)

Local River : Sone

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Winter    |           |           |           |           | Summer    |      |      |      |      |      |      |      |      |      |
|------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|------|------|
|      |                         | Jan - Feb |           |           |           |           | Mar - May |      |      |      |      |      |      |      |      |      |
|      |                         | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|      | <b>CHEMICAL INDICES</b> |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |
| 1    | HAR_Ca (mgCaCO3/L)      | 107       | 111       | 116       | 107       | 112       | 191       | 154  | 156  | 104  | 131  | 129  | 125  | 126  | 92   | 104  |
| 2    | HAR_Total (mgCaCO3/L)   | 361       | 359       | 264       | 353       | 356       | 389       | 404  | 391  | 325  | 424  | 439  | 435  | 294  | 316  | 340  |
| 3    | Na% (%)                 | 29        | 28        | 24        | 34        | 33        | 27        | 27   | 25   | 27   | 25   | 29   | 24   | 27   | 34   | 33   |
| 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  |
| 5    | SAR (-)                 | 1.6       | 1.5       | 1.1       | 2.0       | 1.9       | 1.5       | 1.5  | 1.4  | 1.3  | 1.4  | 1.8  | 1.3  | 1.4  | 1.9  | 1.8  |
|      | <b>PESTICIDES</b>       |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |

## HISTORY SHEET

|                   |                              |                   |                          |
|-------------------|------------------------------|-------------------|--------------------------|
|                   |                              | <b>Water Year</b> | <b>: 2015-2016</b>       |
| <b>Site</b>       | <b>: DUDDHI</b>              | <b>Code</b>       | <b>: GGT3OE8</b>         |
| State             | : Uttar Pradesh              | District          | Sonbhadra                |
| Basin             | : Ganga-Brahm-Meghna Basin   | Independent River | : Ganga                  |
| Tributary         | : Sone                       | Sub Tributary     | : Kanhar                 |
| Sub-Sub Tributary | : -                          | Local River       | : Kanhar                 |
| Division          | : M Ganga Div. III, Varanasi | Sub-Division      | : U Sone Rehand SD, Rewa |
| Drainage Area     | : 5169 Sq. Km.               | Bank              | : Left                   |
| Latitude          | : 24°13'38"                  | Longitude         | : 83°16'29"              |
|                   | Opening Date                 | Closing Date      |                          |
| Gauge             | : 01-06-04                   |                   |                          |
| Discharge         | : 01-06-04                   |                   |                          |
| Sediment          | : 01-06-04                   |                   |                          |
| Water Quality     | : 01-06-04                   |                   |                          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

## River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | 01-06-15   | 01-07-15   | 01-08-15   | 01-09-15   | 01-10-15   | 02-11-15   | 01-12-15   | 01-01-16   | 01-02-16   | 01-03-16   | 01-04-16   | 02-05-16 |
|------|----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|
|      |                      | A          | A          | A          | A          | A          | A          | A          | A          | A          | A          | A          | A        |
|      | <b>PHYSICAL</b>      |            |            |            |            |            |            |            |            |            |            |            |          |
| 1    | Q (cumec)            | 0.030      | 16.07      | 345.7      | 83.87      | 18.64      | 19.85      | 5.354      | 3.652      | 2.024      | 1.438      | 0.741      | No Flow  |
| 2    | Colour_Cod (-)       | Clear      | Brown      | Brown      | Brown      | Clear      | Clear      | Clear      | Clear      | Clear      | Clear      | Clear      |          |
| 3    | EC_FLD (μmho/cm)     | 320        | 290        | 140        | 230        | 150        | 210        | 190        | 150        | 190        | 180        | 220        |          |
| 4    | EC_GEN (μmho/cm)     | 304        | 133        | 137        | 230        | 146        | 202        | 190        | 144        | 180        | 170        | 219        |          |
| 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 |          |
| 6    | pH_FLD (pH units)    | 7.8        | 7.5        | 7.5        | 7.5        | 7.5        | 8.1        | 7.6        | 7.5        | 7.5        | 7.5        | 7.8        |          |
| 7    | pH_GEN (pH units)    | 8.1        | 7.8        | 7.6        | 7.6        | 7.6        | 8.2        | 7.7        | 7.7        | 7.7        | 7.6        | 8.0        |          |
| 8    | TDS (mg/L)           | 182        | 80         | 82         | 138        | 90         | 126        | 115        | 86         | 110        | 102        | 132        |          |
| 9    | Temp (deg C)         | 30.0       | 27.0       | 27.0       | 27.0       | 27.0       | 23.0       | 20.0       | 11.0       | 14.0       | 17.0       | 22.0       |          |
| 10   | Turb (NTU)           | 0.2        | 3.2        | 5.6        | 7.2        | 0.2        | 0.4        | 0.5        | 0.4        | 0.8        | 0.6        | 0.8        |          |
|      | <b>CHEMICAL</b>      |            |            |            |            |            |            |            |            |            |            |            |          |
| 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        |          |
| 2    | ALK-TOT (mgCaCO3/L)  | 116        | 76         | 76         | 108        | 88         | 104        | 100        | 88         | 100        | 96         | 108        |          |
| 3    | B (mg/L)             | 0.03       | 0.03       | 0.03       | 0.03       | 0.03       | 0.03       | 0.03       | 0.02       | 0.02       | 0.02       | 0.02       |          |
| 4    | Ca (mg/L)            | 32         | 21         | 21         | 30         | 24         | 29         | 27         | 22         | 26         | 24         | 29         |          |
| 5    | Cl (mg/L)            | 20.0       | 12.0       | 12.0       | 20.0       | 16.0       | 18.0       | 16.0       | 12.0       | 16.0       | 14.0       | 24.0       |          |
| 6    | 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        |          |
| 7    | F (mg/L)             | 0.34       | 0.20       | 0.22       | 0.29       | 0.26       | 0.27       | 0.25       | 0.20       | 0.24       | 0.23       | 0.26       |          |
| 8    | Fe (mg/L)            | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |          |
| 9    | HCO3 (mg/L)          | 142        | 93         | 93         | 132        | 107        | 127        | 122        | 107        | 122        | 117        | 132        |          |
| 10   | K (mg/L)             | 7.0        | 4.0        | 5.0        | 7.0        | 5.0        | 6.0        | 5.0        | 4.0        | 5.0        | 5.0        | 7.0        |          |
| 11   | Mg (mg/L)            | 14.6       | 8.8        | 9.8        | 13.7       | 11.7       | 12.7       | 11.7       | 9.8        | 11.7       | 10.7       | 13.7       |          |
| 12   | Na (mg/L)            | 14.0       | 8.0        | 8.0        | 14.0       | 11.0       | 12.0       | 11.0       | 8.0        | 10.0       | 9.0        | 15.0       |          |
| 13   | NH3-N (mg N/L)       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |          |
| 14   | NO2+NO3 (mg N/L)     | 0.36       | 0.25       | 0.26       | 0.27       | 0.27       | 0.26       | 0.25       | 0.24       | 0.25       | 0.24       | 0.25       |          |
| 15   | NO2-N (mgN/L)        | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |          |
| 16   | NO3-N (mgN/L)        | 0.36       | 0.25       | 0.26       | 0.27       | 0.27       | 0.26       | 0.25       | 0.24       | 0.25       | 0.24       | 0.25       |          |
| 17   | P-Tot (mgP/L)        | 0.022      | 0.016      | 0.018      | 0.024      | 0.020      | 0.020      | 0.018      | 0.014      | 0.018      | 0.016      | 0.018      |          |
| 18   | SiO2 (mg/L)          | 8.8        | 6.8        | 7.0        | 8.2        | 7.4        | 8.0        | 7.6        | 7.2        | 7.5        | 2.4        | 7.6        |          |
| 19   | SO4 (mg/L)           | 20.0       | 14.0       | 12.0       | 18.0       | 14.0       | 18.0       | 16.0       | 12.0       | 16.0       | 14.0       | 17.0       |          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 01-06-15 | 01-07-15 | 01-08-15 | 01-09-15 | 01-10-15 | 02-11-15 | 01-12-15 | 01-01-16 | 01-02-16 | 01-03-16 | 01-04-16 | 02-05-16 |
|------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      |                                   | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |          |          |          |          |          |          |          |          |          |          |          |          |
| 1    | BOD3-27 (mg/L)                    | 2.6      | 2.8      | 2.5      | 2.4      | 2.5      | 1.6      | 2.6      | 2.4      | 2.6      | 2.4      | 2.5      |          |
| 2    | COD (mg/L)                        | 16.8     | 12.2     | 11.5     | 12.6     | 12.1     | 10.5     | 12.4     | 11.2     | 12.4     | 10.1     | 11.7     |          |
| 3    | DO (mg/L)                         | 6.9      | 7.5      | 7.6      | 7.5      | 7.3      | 7.1      | 7.5      | 8.2      | 8.0      | 8.0      | 8.6      |          |
| 4    | DO_SAT% (%)                       | 91       | 93       | 96       | 93       | 91       | 82       | 82       | 75       | 78       | 83       | 99       |          |
| 5    | FCol-MPN (MPN/100mL)              | 500      | 300      | 300      | 200      | 300      | 400      | 500      | 700      | 800      | 800      | 1000     |          |
| 6    | Tcol-MPN (MPN/100mL)              | 1800     | 1100     | 1000     | 900      | 1100     | 1200     | 1400     | 1200     | 1400     | 1400     | 1800     |          |
|      | <b>TRACE &amp; TOXIC</b>          |          |          |          |          |          |          |          |          |          |          |          |          |
|      | <b>CHEMICAL INDICES</b>           |          |          |          |          |          |          |          |          |          |          |          |          |
| 1    | HAR_Ca (mgCaCO3/L)                | 80       | 52       | 52       | 76       | 60       | 72       | 68       | 56       | 64       | 60       | 72       |          |
| 2    | HAR_Total (mgCaCO3/L)             | 141      | 89       | 93       | 133      | 109      | 125      | 117      | 97       | 113      | 105      | 129      |          |
| 3    | Na% (%)                           | 17       | 16       | 15       | 18       | 17       | 17       | 16       | 15       | 15       | 15       | 19       |          |
| 4    | RSC (-)                           | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      |          |
| 5    | SAR (-)                           | 0.5      | 0.4      | 0.4      | 0.5      | 0.5      | 0.5      | 0.4      | 0.4      | 0.4      | 0.4      | 0.6      |          |
|      | <b>PESTICIDES</b>                 |          |          |          |          |          |          |          |          |          |          |          |          |

# Water Quality Datasheet for the period : 2015-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

## Well Water Analysis

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | 02-11-15<br>B | 02-05-16<br>B |
|------|-----------------------------------|---------------|---------------|
|      | <b>PHYSICAL</b>                   |               |               |
| 1    | Colour_Cod (-)                    | Clear         | Clear         |
| 2    | EC_FLD (µmho/cm)                  | 710           | 770           |
| 3    | EC_GEN (µmho/cm)                  | 702           | 761           |
| 4    | Odour_Code (-)                    | odour free    | odour free    |
| 5    | pH_FLD (pH units)                 | 7.5           | 7.2           |
| 6    | pH_GEN (pH units)                 | 7.6           | 7.3           |
| 7    | TDS (mg/L)                        | 420           | 460           |
| 8    | Temp (deg C)                      | 23.0          | 25.0          |
|      | <b>CHEMICAL</b>                   |               |               |
| 1    | Alk-Phen (mgCaCO3/L)              | 0.0           | 0.0           |
| 2    | ALK-TOT (mgCaCO3/L)               | 228           | 252           |
| 3    | B (mg/L)                          | 0.04          | 0.04          |
| 4    | Ca (mg/L)                         | 59            | 66            |
| 5    | Cl (mg/L)                         | 60.0          | 72.0          |
| 6    | CO3 (mg/L)                        | 0.0           | 0.0           |
| 7    | F (mg/L)                          | 0.54          | 0.59          |
| 8    | Fe (mg/L)                         | 0.3           | 0.3           |
| 9    | HCO3 (mg/L)                       | 278           | 307           |
| 10   | K (mg/L)                          | 11.0          | 12.0          |
| 11   | Mg (mg/L)                         | 35.1          | 39.0          |
| 12   | Na (mg/L)                         | 44.0          | 52.0          |
| 13   | NH3-N (mg N/L)                    | 0.00          | 0.00          |
| 14   | NO2+NO3 (mg N/L)                  | 0.53          | 0.54          |
| 15   | NO2-N (mgN/L)                     | 0.14          | 0.15          |
| 16   | NO3-N (mgN/L)                     | 0.39          | 0.40          |
| 17   | P-Tot (mgP/L)                     | 0.024         | 0.028         |
| 18   | SiO2 (mg/L)                       | 8.5           | 8.8           |
| 19   | SO4 (mg/L)                        | 48.0          | 55.0          |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |               |               |
|      | <b>TRACE &amp; TOXIC</b>          |               |               |
|      | <b>CHEMICAL INDICES</b>           |               |               |
| 1    | HAR_Ca (mgCaCO3/L)                | 148           | 164           |
| 2    | HAR_Total (mgCaCO3/L)             | 295           | 327           |
| 3    | Na% (%)                           | 24            | 25            |
| 4    | RSC (-)                           | 0.0           | 0.0           |
| 5    | SAR (-)                           | 1.1           | 1.3           |
|      | <b>PESTICIDES</b>                 |               |               |

# Water Quality Summary for the period : 2015-2016

Station Name : DUDDHI ( GGT3OE8)

Division : M Ganga Div. III, Varanasi

Local River : Kanhar

Sub-Division : U Sone Rehand SD, Rewa

## River Water Summary

| S.No | Parameters                        | Number of Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|------------------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |                        |         |         |       |
| 1    | Q (cumec)                         | 366                    | 1126    | 0.000   | 42.62 |
| 2    | EC_FLD (μmho/cm)                  | 11                     | 320     | 140     | 206   |
| 3    | EC_GEN (μmho/cm)                  | 11                     | 304     | 133     | 187   |
| 4    | pH_FLD (pH units)                 | 11                     | 8.1     | 7.5     | 7.6   |
| 5    | pH_GEN (pH units)                 | 11                     | 8.2     | 7.6     | 7.8   |
| 6    | TDS (mg/L)                        | 11                     | 182     | 80      | 113   |
| 7    | Temp (deg C)                      | 11                     | 30.0    | 11.0    | 22.3  |
| 8    | Turb (NTU)                        | 11                     | 7.2     | 0.2     | 1.8   |
|      | <b>CHEMICAL</b>                   |                        |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 11                     | 0.0     | 0.0     | 0     |
| 2    | ALK-TOT (mgCaCO3/L)               | 11                     | 116     | 76      | 96    |
| 3    | B (mg/L)                          | 11                     | 0.03    | 0.02    | 0.03  |
| 4    | Ca (mg/L)                         | 11                     | 32      | 21      | 26    |
| 5    | Cl (mg/L)                         | 11                     | 24.0    | 12.0    | 16.4  |
| 6    | CO3 (mg/L)                        | 11                     | 0.0     | 0.0     | 0     |
| 7    | F (mg/L)                          | 11                     | 0.34    | 0.20    | 0.25  |
| 8    | Fe (mg/L)                         | 11                     | 0.0     | 0.0     | 0     |
| 9    | HCO3 (mg/L)                       | 11                     | 142     | 93      | 118   |
| 10   | K (mg/L)                          | 11                     | 7.0     | 4.0     | 5.5   |
| 11   | Mg (mg/L)                         | 11                     | 14.6    | 8.8     | 11.7  |
| 12   | Na (mg/L)                         | 11                     | 15.0    | 8.0     | 10.9  |
| 13   | NH3-N (mg N/L)                    | 11                     | 0.00    | 0.00    | 0     |
| 14   | NO2+NO3 (mg N/L)                  | 11                     | 0.36    | 0.24    | 0.26  |
| 15   | NO2-N (mgN/L)                     | 11                     | 0.00    | 0.00    | 0     |
| 16   | NO3-N (mgN/L)                     | 11                     | 0.36    | 0.24    | 0.26  |
| 17   | P-Tot (mgP/L)                     | 11                     | 0.024   | 0.014   | 0.019 |
| 18   | SiO2 (mg/L)                       | 11                     | 8.8     | 2.4     | 7.1   |
| 19   | SO4 (mg/L)                        | 11                     | 20.0    | 12.0    | 15.5  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                        |         |         |       |
| 1    | BOD3-27 (mg/L)                    | 11                     | 2.8     | 1.6     | 2.4   |
| 2    | COD (mg/L)                        | 11                     | 16.8    | 10.1    | 12.1  |
| 3    | DO (mg/L)                         | 11                     | 8.6     | 6.9     | 7.6   |
| 4    | DO_SAT% (%)                       | 11                     | 99      | 75      | 88    |
| 5    | FCol-MPN (MPN/100mL)              | 11                     | 1000    | 200     | 527   |
| 6    | Tcol-MPN (MPN/100mL)              | 11                     | 1800    | 900     | 1300  |
|      | <b>TRACE &amp; TOXIC</b>          |                        |         |         |       |
|      | <b>CHEMICAL INDICES</b>           |                        |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 11                     | 80      | 52      | 65    |
| 2    | HAR_Total (mgCaCO3/L)             | 11                     | 141     | 89      | 114   |
| 3    | Na% (%)                           | 11                     | 19      | 15      | 16    |
| 4    | RSC (-)                           | 11                     | 0.0     | 0.0     | 0     |
| 5    | SAR (-)                           | 11                     | 0.6     | 0.4     | 0.4   |
|      | <b>PESTICIDES</b>                 |                        |         |         |       |

# Water Quality Summary for the period : 2015-2016

Station Name : DUDDHI ( GGT3OE8)

Division : M Ganga Div. III, Varanasi

Local River : Kanhar

Sub-Division : U Sone Rehand SD, Rewa

## Well Water Summary

| S.No | Parameters                        | Observations | Maximum | Minimum | Mean  |
|------|-----------------------------------|--------------|---------|---------|-------|
|      | <b>PHYSICAL</b>                   |              |         |         |       |
| 1    | EC_FLD (μmho/cm)                  | 2            | 770     | 710     | 740   |
| 2    | EC_GEN (μmho/cm)                  | 2            | 761     | 702     | 732   |
| 3    | pH_FLD (pH units)                 | 2            | 7.5     | 7.2     | 7.3   |
| 4    | pH_GEN (pH units)                 | 2            | 7.6     | 7.3     | 7.5   |
| 5    | TDS (mg/L)                        | 2            | 460     | 420     | 440   |
| 6    | Temp (deg C)                      | 2            | 25.0    | 23.0    | 24.0  |
|      | <b>CHEMICAL</b>                   |              |         |         |       |
| 1    | Alk-Phen (mgCaCO3/L)              | 2            | 0.0     | 0.0     | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)               | 2            | 252     | 228     | 240   |
| 3    | B (mg/L)                          | 2            | 0.04    | 0.04    | 0.04  |
| 4    | Ca (mg/L)                         | 2            | 66      | 59      | 63    |
| 5    | Cl (mg/L)                         | 2            | 72.0    | 60.0    | 66.0  |
| 6    | CO3 (mg/L)                        | 2            | 0.0     | 0.0     | 0.0   |
| 7    | F (mg/L)                          | 2            | 0.59    | 0.54    | 0.57  |
| 8    | Fe (mg/L)                         | 2            | 0.3     | 0.3     | 0.3   |
| 9    | HCO3 (mg/L)                       | 2            | 307     | 278     | 293   |
| 10   | K (mg/L)                          | 2            | 12.0    | 11.0    | 11.5  |
| 11   | Mg (mg/L)                         | 2            | 39.0    | 35.1    | 37.1  |
| 12   | Na (mg/L)                         | 2            | 52.0    | 44.0    | 48.0  |
| 13   | NH3-N (mg N/L)                    | 2            | 0.00    | 0.00    | 0.00  |
| 14   | NO2+NO3 (mg N/L)                  | 2            | 0.54    | 0.53    | 0.54  |
| 15   | NO2-N (mgN/L)                     | 2            | 0.15    | 0.14    | 0.14  |
| 16   | NO3-N (mgN/L)                     | 2            | 0.40    | 0.39    | 0.39  |
| 17   | P-Tot (mgP/L)                     | 2            | 0.028   | 0.024   | 0.026 |
| 18   | SiO2 (mg/L)                       | 2            | 8.8     | 8.5     | 8.7   |
| 19   | SO4 (mg/L)                        | 2            | 55.0    | 48.0    | 51.5  |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |              |         |         |       |
|      | <b>TRACE &amp; TOXIC</b>          |              |         |         |       |
|      | <b>CHEMICAL INDICES</b>           |              |         |         |       |
| 1    | HAR_Ca (mgCaCO3/L)                | 2            | 164     | 148     | 156   |
| 2    | HAR_Total (mgCaCO3/L)             | 2            | 327     | 295     | 311   |
| 3    | Na% (%)                           | 2            | 25      | 24      | 24    |
| 4    | RSC (-)                           | 2            | 0.0     | 0.0     | 0.0   |
| 5    | SAR (-)                           | 2            | 1.3     | 1.1     | 1.2   |
|      | <b>PESTICIDES</b>                 |              |         |         |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Flood<br>Jun - Oct |       |       |       |       |       |       |       |       |       |
|------|----------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |                      | 2006               | 2007  | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  |
|      | <b>PHYSICAL</b>      |                    |       |       |       |       |       |       |       |       |       |
| 1    | Q (cumec)            | 528.8              | 276.5 | 272.1 | 70.47 | 47.93 | 105.9 | 356.7 | 72.23 | 19.83 | 92.86 |
| 2    | EC_FLD (µmho/cm)     | 178                | 200   | 190   | 307   | 232   | 203   | 554   | 214   | 214   | 226   |
| 3    | EC_GEN (µmho/cm)     | 153                | 150   | 181   | 302   | 228   | 196   | 190   | 207   | 208   | 190   |
| 4    | pH_FLD (pH units)    | 7.9                | 8.0   | 7.9   | 8.1   | 8.0   | 8.1   | 7.7   | 7.9   | 7.9   | 7.6   |
| 5    | pH_GEN (pH units)    | 8.3                | 8.2   | 8.2   | 8.2   | 8.2   | 8.5   | 7.8   | 8.1   | 8.0   | 7.8   |
| 6    | TDS (mg/L)           |                    |       |       | 163   | 131   | 99    | 101   | 120   | 124   | 114   |
| 7    | Temp (deg C)         | 29.7               | 29.7  | 29.2  | 29.0  | 27.3  | 27.0  | 26.8  | 26.5  | 21.7  | 27.6  |
| 8    | Turb (NTU)           |                    |       |       |       | 0.1   | 1.8   | 0.6   | 2.4   | 4.0   | 3.3   |
|      | <b>CHEMICAL</b>      |                    |       |       |       |       |       |       |       |       |       |
| 1    | Alk-Phen (mgCaCO3/L) | 3.2                | 0.0   | 0.0   | 0.0   | 4.0   | 23.9  | 8.5   | 4.0   | 0.0   | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)  | 173                | 154   | 89    | 124   | 85    | 134   | 122   | 110   | 96    | 93    |
| 3    | B (mg/L)             | 0.01               | 0.05  | 0.01  | 0.01  | 0.01  | 0.00  | 0.02  | 0.03  | 0.01  | 0.03  |
| 4    | Ca (mg/L)            | 14                 | 30    | 26    | 23    | 29    | 30    | 34    | 29    | 30    | 26    |
| 5    | Cl (mg/L)            | 21.6               | 29.2  | 29.5  | 37.7  | 39.2  | 33.2  | 32.8  | 32.0  | 26.8  | 16.0  |
| 6    | CO3 (mg/L)           | 3.8                | 0.0   | 0.0   | 0.0   | 4.8   | 28.8  | 10.2  | 4.8   | 0.0   | 0.0   |
| 7    | F (mg/L)             | 0.05               | 0.11  | 0.10  | 0.66  | 0.49  | 0.49  | 0.55  | 0.49  | 0.36  | 0.26  |
| 8    | Fe (mg/L)            | 0.0                | 0.4   | 0.0   | 0.1   | 0.2   | 0.1   | 0.2   | 0.2   | 0.2   | 0.0   |
| 9    | HCO3 (mg/L)          | 121                | 146   | 109   | 152   | 94    | 105   | 128   | 125   | 117   | 113   |
| 10   | K (mg/L)             | 2.2                | 6.6   | 7.5   | 4.0   | 5.8   | 5.6   | 8.4   | 7.2   | 5.8   | 5.6   |
| 11   | Mg (mg/L)            | 6.5                | 16.1  | 11.0  | 15.6  | 13.8  | 13.5  | 14.6  | 14.5  | 13.6  | 11.7  |
| 12   | Na (mg/L)            | 8.4                | 23.8  | 22.2  | 26.6  | 23.6  | 13.2  | 12.6  | 11.4  | 11.0  | 11.0  |
| 13   | NH3-N (mg N/L)       | 0.05               | 0.05  | 0.05  | 0.08  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |
| 14   | NO2+NO3 (mg N/L)     | 0.54               | 0.43  | 0.09  | 0.22  | 0.22  | 0.21  | 0.23  | 0.21  | 0.19  | 0.28  |
| 15   | NO2-N (mgN/L)        | 0.01               | 0.02  | 0.02  | 0.04  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| 16   | NO3-N (mgN/L)        | 0.52               | 0.41  | 0.07  | 0.18  | 0.22  | 0.21  | 0.23  | 0.21  | 0.19  | 0.28  |
| 17   | P-Tot (mgP/L)        | 0.001              | 0.020 | 0.001 | 0.010 | 0.001 | 0.001 | 0.001 | 0.001 | 0.019 | 0.020 |
| 18   | SiO2 (mg/L)          | 9.3                | 9.6   | 6.2   | 7.8   | 7.2   | 7.5   | 8.8   | 8.3   | 8.0   | 7.6   |
| 19   | SO4 (mg/L)           | 24.4               | 18.2  | 35.1  | 12.7  | 34.6  | 18.8  | 23.8  | 22.4  | 18.8  | 15.6  |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood<br>Jun - Oct |      |      |      |      |      |      |      |      |      |
|------|-----------------------------------|--------------------|------|------|------|------|------|------|------|------|------|
|      |                                   | 2006               | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                    |      |      |      |      |      |      |      |      |      |
| 1    | BOD3-27 (mg/L)                    |                    |      |      | 2.5  | 2.9  | 2.7  | 3.2  | 3.0  | 2.7  | 2.5  |
| 2    | COD (mg/L)                        |                    | 1.7  | 2.7  | 3.9  | 7.5  | 7.4  | 6.6  | 8.0  | 10.6 | 13.0 |
| 3    | DO (mg/L)                         |                    |      |      | 6.9  | 7.2  | 7.5  | 7.0  | 7.3  | 6.8  | 7.3  |
| 4    | DO_SAT% (%)                       |                    |      |      | 89   | 91   | 93   | 87   | 90   | 77   | 93   |
| 5    | FCol-MPN (MPN/100mL)              |                    | 40   | 98   | 2150 | 130  | 320  | 260  | 260  | 240  | 320  |
| 6    | Tcol-MPN (MPN/100mL)              |                    | 580  | 475  | 4000 | 780  | 940  | 900  | 920  | 880  | 1180 |
|      | <b>TRACE &amp; TOXIC</b>          |                    |      |      |      |      |      |      |      |      |      |
| 1    | As (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
| 2    | Cd (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
| 3    | Cr (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
| 4    | Ni (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
| 5    | Pb (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
| 6    | Zn (µg/L)                         |                    |      |      |      |      |      |      |      |      |      |
|      | <b>CHEMICAL INDICES</b>           |                    |      |      |      |      |      |      |      |      |      |
| 1    | HAR_Ca (mgCaCO3/L)                | 34                 | 74   | 64   | 57   | 72   | 76   | 85   | 72   | 76   | 64   |
| 2    | HAR_Total (mgCaCO3/L)             | 61                 | 142  | 110  | 122  | 129  | 132  | 145  | 133  | 133  | 113  |
| 3    | Na% (%)                           | 23                 | 26   | 29   | 32   | 27   | 17   | 15   | 15   | 15   | 17   |
| 4    | RSC (-)                           | 0.9                | 0.1  | 0.0  | 0.1  | 0.0  | 0.2  | 0.0  | 0.0  | 0.0  | 0.0  |
| 5    | SAR (-)                           | 0.5                | 0.9  | 0.9  | 1.1  | 0.9  | 0.5  | 0.5  | 0.4  | 0.4  | 0.4  |
|      | <b>PESTICIDES</b>                 |                    |      |      |      |      |      |      |      |      |      |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Winter    |           |           |           |           |           |           |           |           |           |
|------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|      |                      | Nov - Feb |           |           |           |           |           |           |           |           |           |
|      |                      | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 |
|      | <b>PHYSICAL</b>      |           |           |           |           |           |           |           |           |           |           |
| 1    | Q (cumec)            | 12.80     | 22.46     | 8.225     | 6.560     | 3.724     | 10.64     | 14.06     | 26.87     | 6.243     | 7.720     |
| 2    | EC_FLD (µmho/cm)     | 273       | 188       | 203       | 274       | 258       | 213       | 221       | 249       | 288       | 185       |
| 3    | EC_GEN (µmho/cm)     | 246       | 143       | 193       | 270       | 254       | 207       | 215       | 243       | 285       | 179       |
| 4    | pH_FLD (pH units)    | 7.9       | 8.0       | 8.0       | 7.7       | 8.1       | 8.2       | 8.1       | 8.2       | 8.0       | 7.7       |
| 5    | pH_GEN (pH units)    | 8.3       | 8.2       | 8.2       | 8.0       | 8.4       | 8.4       | 8.2       | 8.4       | 8.1       | 7.8       |
| 6    | TDS (mg/L)           |           |           |           | 135       | 154       | 104       | 140       | 138       | 167       | 109       |
| 7    | Temp (deg C)         | 20.4      | 21.1      | 19.4      | 18.0      | 22.1      | 19.6      | 17.4      | 21.3      | 19.3      | 17.0      |
| 8    | Turb (NTU)           |           |           |           |           | 0.1       | 0.3       | 0.2       | 0.3       | 1.4       | 0.5       |
|      | <b>CHEMICAL</b>      |           |           |           |           |           |           |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L) | 0.0       | 0.0       | 0.0       | 2.0       | 6.6       | 19.9      | 12.5      | 7.5       | 0.0       | 0.0       |
| 2    | ALK-TOT (mgCaCO3/L)  | 220       | 222       | 113       | 130       | 97        | 117       | 121       | 107       | 101       | 98        |
| 3    | B (mg/L)             | 0.00      | 0.03      | 0.07      | 0.00      | 0.05      | 0.03      | 0.03      | 0.03      | 0.03      | 0.02      |
| 4    | Ca (mg/L)            | 17        | 36        | 30        | 22        | 23        | 23        | 31        | 26        | 33        | 26        |
| 5    | Cl (mg/L)            | 37.0      | 25.0      | 35.8      | 44.3      | 41.6      | 28.0      | 31.5      | 26.5      | 28.0      | 15.5      |
| 6    | CO3 (mg/L)           | 0.0       | 0.0       | 0.0       | 2.4       | 8.0       | 24.0      | 15.0      | 9.0       | 0.0       | 0.0       |
| 7    | F (mg/L)             | 0.10      | 0.13      | 0.08      | 0.48      | 0.46      | 0.34      | 0.37      | 0.31      | 0.32      | 0.24      |
| 8    | Fe (mg/L)            | 0.1       | 0.5       | 0.1       | 0.1       | 0.2       | 0.2       | 0.2       | 0.2       | 0.2       | 0.0       |
| 9    | HCO3 (mg/L)          | 134       | 135       | 138       | 153       | 102       | 94        | 117       | 112       | 123       | 120       |
| 10   | K (mg/L)             | 5.0       | 7.3       | 8.5       | 2.3       | 6.2       | 5.3       | 6.8       | 6.8       | 7.3       | 5.0       |
| 11   | Mg (mg/L)            | 16.0      | 15.2      | 15.3      | 15.9      | 17.4      | 16.6      | 13.9      | 14.9      | 14.7      | 11.5      |
| 12   | Na (mg/L)            | 15.0      | 27.5      | 24.2      | 31.9      | 26.0      | 11.5      | 11.3      | 10.8      | 13.3      | 10.3      |
| 13   | NH3-N (mg N/L)       | 0.05      | 0.05      | 0.05      | 0.05      | 0.14      | 0.05      | 0.05      | 0.05      | 0.00      | 0.00      |
| 14   | NO2+NO3 (mg N/L)     | 0.21      | 0.01      | 0.01      | 0.21      | 0.44      | 0.32      | 0.27      | 0.20      | 0.28      | 0.25      |
| 15   | NO2-N (mgN/L)        | 0.00      | 0.00      | 0.00      | 0.05      | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      | 0.00      |
| 16   | NO3-N (mgN/L)        | 0.21      | 0.01      | 0.01      | 0.16      | 0.44      | 0.32      | 0.27      | 0.20      | 0.28      | 0.25      |
| 17   | P-Tot (mgP/L)        | 0.002     | 0.022     | 0.020     | 0.010     | 0.031     | 0.001     | 0.001     | 0.001     | 0.021     | 0.017     |
| 18   | SiO2 (mg/L)          | 9.1       | 8.6       | 8.3       | 6.8       | 8.4       | 8.0       | 8.0       | 8.2       | 8.4       | 7.6       |
| 19   | SO4 (mg/L)           | 15.8      | 27.5      | 32.5      | 5.5       | 28.4      | 21.0      | 21.0      | 20.5      | 24.0      | 15.5      |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Winter    |           |           |           |           |           |           |           |           |           |
|------|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|      |                                   | Nov - Feb |           |           |           |           |           |           |           |           |           |
|      |                                   | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |           |           |           |           |           |           |           |           |           |
| 1    | BOD3-27 (mg/L)                    |           |           |           | 2.3       | 2.7       | 2.7       | 2.7       | 2.7       | 2.6       | 2.3       |
| 2    | COD (mg/L)                        | 1.0       | 1.6       | 2.5       | 4.8       | 8.0       | 5.7       | 10.4      | 10.3      | 14.3      | 11.6      |
| 3    | DO (mg/L)                         |           |           |           | 7.3       | 8.1       | 7.9       | 7.8       | 7.6       | 7.1       | 7.7       |
| 4    | DO_SAT% (%)                       |           |           |           | 77        | 93        | 86        | 81        | 86        | 77        | 79        |
| 5    | FCol-MPN (MPN/100mL)              | 0         | 25        | 125       | 1475      | 150       | 250       | 225       | 295       | 225       | 600       |
| 6    | Tcol-MPN (MPN/100mL)              | 150       | 425       | 725       | 2575      | 800       | 850       | 850       | 1000      | 900       | 1300      |
|      | <b>TRACE &amp; TOXIC</b>          |           |           |           |           |           |           |           |           |           |           |
| 1    | As (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
| 2    | Cd (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
| 3    | Cr (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
| 4    | Ni (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
| 5    | Pb (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
| 6    | Zn (µg/L)                         |           |           |           |           |           |           |           |           |           |           |
|      | <b>CHEMICAL INDICES</b>           |           |           |           |           |           |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)                | 42        | 90        | 76        | 55        | 59        | 57        | 78        | 65        | 81        | 65        |
| 2    | HAR_Total (mgCaCO3/L)             | 108       | 154       | 139       | 121       | 131       | 126       | 136       | 128       | 143       | 113       |
| 3    | Na% (%)                           | 23        | 27        | 26        | 36        | 29        | 16        | 15        | 15        | 16        | 16        |
| 4    | RSC (-)                           | 0.3       | 0.0       | 0.0       | 0.2       | 0.0       | 0.0       | 0.0       | 0.1       | 0.0       | 0.0       |
| 5    | SAR (-)                           | 0.6       | 1.0       | 0.9       | 1.3       | 1.0       | 0.4       | 0.4       | 0.4       | 0.5       | 0.4       |
|      | <b>PESTICIDES</b>                 |           |           |           |           |           |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters           | Summer    |       |       |       |       |       |       |       |       |       |
|------|----------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |                      | Mar - May |       |       |       |       |       |       |       |       |       |
|      |                      | 2007      | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  |
|      | <b>PHYSICAL</b>      |           |       |       |       |       |       |       |       |       |       |
| 1    | Q (cumec)            | 3.070     | 2.247 | 0.777 | 0.423 | 0.470 | 2.888 | 3.857 | 6.224 | 1.686 | 0.726 |
| 2    | EC_FLD (µmho/cm)     | 210       | 200   | 300   | 328   | 173   | 220   | 236   | 259   | 320   | 200   |
| 3    | EC_GEN (µmho/cm)     | 185       | 181   | 287   | 322   | 169   | 214   | 229   | 252   | 313   | 195   |
| 4    | pH_FLD (pH units)    | 7.9       | 9.0   | 7.7   | 8.1   | 8.5   | 8.4   | 8.2   | 8.1   | 7.7   | 7.7   |
| 5    | pH_GEN (pH units)    | 8.2       | 9.1   | 8.2   | 8.5   | 8.9   | 8.5   | 8.3   | 8.3   | 8.0   | 7.8   |
| 6    | TDS (mg/L)           |           |       |       | 175   | 112   | 111   | 165   | 138   | 187   | 117   |
| 7    | Temp (deg C)         | 24.2      | 21.8  | 22.0  | 23.0  | 23.2  | 21.2  | 21.2  | 21.8  | 21.3  | 19.5  |
| 8    | Turb (NTU)           |           |       |       | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0.3   | 0.7   |
|      | <b>CHEMICAL</b>      |           |       |       |       |       |       |       |       |       |       |
| 1    | Alk-Phen (mgCaCO3/L) | 0.0       | 0.0   | 0.0   | 14.6  | 13.3  | 19.9  | 19.9  | 10.0  | 0.0   | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)  | 205       | 237   | 124   | 139   | 111   | 136   | 136   | 115   | 116   | 102   |
| 3    | B (mg/L)             | 0.01      |       | 0.00  | 0.00  | 0.04  | 0.03  | 0.03  | 0.03  | 0.03  | 0.02  |
| 4    | Ca (mg/L)            | 19        | 34    | 27    | 29    | 37    | 25    | 29    | 28    | 34    | 26    |
| 5    | Cl (mg/L)            | 29.3      | 24.7  | 36.9  | 47.2  | 23.0  | 30.0  | 30.7  | 21.3  | 24.3  | 19.0  |
| 6    | CO3 (mg/L)           | 0.0       | 0.0   | 0.0   | 17.6  | 16.0  | 24.0  | 24.0  | 12.0  | 0.0   | 0.0   |
| 7    | F (mg/L)             | 0.11      |       | 0.21  | 0.65  | 0.52  | 0.44  | 0.39  | 0.31  | 0.35  | 0.24  |
| 8    | Fe (mg/L)            | 0.2       |       | 0.1   | 0.2   | 0.3   | 0.3   | 0.3   | 0.3   | 0.0   | 0.0   |
| 9    | HCO3 (mg/L)          | 125       | 145   | 151   | 134   | 102   | 117   | 117   | 115   | 142   | 124   |
| 10   | K (mg/L)             | 6.0       | 6.7   | 5.7   | 2.4   | 6.0   | 7.3   | 7.3   | 6.3   | 7.3   | 6.0   |
| 11   | Mg (mg/L)            | 16.3      | 14.7  | 17.5  | 13.4  | 12.7  | 17.2  | 15.3  | 15.6  | 15.6  | 12.2  |
| 12   | Na (mg/L)            | 15.3      | 25.7  | 27.4  | 33.4  | 13.7  | 14.0  | 14.0  | 9.0   | 15.3  | 12.0  |
| 13   | NH3-N (mg N/L)       | 0.05      |       | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |
| 14   | NO2+NO3 (mg N/L)     | 0.05      |       | 0.13  | 0.04  | 0.30  | 0.31  | 0.28  | 0.21  | 0.35  | 0.25  |
| 15   | NO2-N (mgN/L)        | 0.00      |       | 0.02  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| 16   | NO3-N (mgN/L)        | 0.05      |       | 0.11  | 0.04  | 0.30  | 0.31  | 0.28  | 0.21  | 0.35  | 0.25  |
| 17   | P-Tot (mgP/L)        | 0.004     |       | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.025 | 0.017 |
| 18   | SiO2 (mg/L)          | 8.4       |       | 9.7   | 6.6   | 8.7   | 8.5   | 8.5   | 8.2   | 8.9   | 5.0   |
| 19   | SO4 (mg/L)           | 11.3      | 26.5  | 21.8  | 9.2   | 25.9  | 21.7  | 22.0  | 21.7  | 23.3  | 15.5  |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

River Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Summer    |      |      |      |      |      |      |      |      |         |
|------|-----------------------------------|-----------|------|------|------|------|------|------|------|------|---------|
|      |                                   | Mar - May |      |      |      |      |      |      |      |      |         |
|      |                                   | 2007      | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016    |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |           |      |      |      |      |      |      |      |      |         |
| 1    | BOD3-27 (mg/L)                    |           |      |      | 1.9  | 3.1  | 3.3  | 2.9  | 2.8  | 2.4  | 2.4     |
| 2    | COD (mg/L)                        | 2.5       | 1.0  | 2.6  | 7.9  | 7.0  | 7.3  | 9.6  | 12.0 | 15.2 | 10.9    |
| 3    | DO (mg/L)                         |           |      |      | 7.8  | 6.6  | 7.8  | 7.5  | 7.5  | 8.1  | 8.3     |
| 4    | DO_SAT% (%)                       |           |      |      | 91   | 77   | 88   | 85   | 85   | 92   | 91      |
| 5    | FCol-MPN (MPN/100mL)              | 0         | 0    | 117  | 833  | 183  | 233  | 233  | 333  | 333  | 900     |
| 6    | Tcol-MPN (MPN/100mL)              | 367       | 233  | 767  | 1300 | 867  | 833  | 800  | 1133 | 1400 | 1600    |
|      | <b>TRACE &amp; TOXIC</b>          |           |      |      |      |      |      |      |      |      |         |
| 1    | As (µg/L)                         |           |      |      |      | 9.0  | 1.0  | 3.0  | 13.0 | 9.0  | No Flow |
| 2    | Cd (µg/L)                         |           |      |      |      | 1.0  | 0.1  | 0.1  | 2.1  | 3.0  |         |
| 3    | Cr (µg/L)                         |           |      |      |      | 6.0  | 2.0  | 5.0  | 9.0  | 10.0 |         |
| 4    | Ni (µg/L)                         |           |      |      |      | 1.8  | 1.0  | 1.0  | 2.0  | 3.0  |         |
| 5    | Pb (µg/L)                         |           |      |      |      | 4.8  | 4.0  | 1.0  | 9.8  | 4.0  |         |
| 6    | Zn (µg/L)                         |           |      |      |      | 2.1  | 3.0  | 0.5  | 2.0  | 5.0  |         |
|      | <b>CHEMICAL INDICES</b>           |           |      |      |      |      |      |      |      |      |         |
| 1    | HAR_Ca (mgCaCO3/L)                | 48        | 84   | 68   | 71   | 92   | 62   | 72   | 71   | 85   | 66      |
| 2    | HAR_Total (mgCaCO3/L)             | 116       | 145  | 141  | 127  | 145  | 133  | 136  | 136  | 150  | 117     |
| 3    | Na% (%)                           | 22        | 27   | 29   | 36   | 17   | 18   | 17   | 12   | 17   | 17      |
| 4    | RSC (-)                           | 0.0       | 0.0  | 0.0  | 0.3  | 0.0  | 0.1  | 0.0  | 0.0  | 0.0  | 0.0     |
| 5    | SAR (-)                           | 0.6       | 0.9  | 1.0  | 1.3  | 0.5  | 0.5  | 0.5  | 0.3  | 0.5  | 0.5     |
|      | <b>PESTICIDES</b>                 |           |      |      |      |      |      |      |      |      |         |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                        | Flood<br>Jun - Oct |       |       |       |       |      |      |      |      |      | Wier<br>Nov |           |           |           |           |
|------|-----------------------------------|--------------------|-------|-------|-------|-------|------|------|------|------|------|-------------|-----------|-----------|-----------|-----------|
|      |                                   | 2006               | 2007  | 2008  | 2009  | 2010  | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007   | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>PHYSICAL</b>                   |                    |       |       |       |       |      |      |      |      |      |             |           |           |           |           |
| 1    | EC_FLD (µmho/cm)                  | 676                | 550   | 580   | 590   | 424   |      |      |      |      |      | 733         | 500       | 618       | 658       | 542       |
| 2    | EC_GEN (µmho/cm)                  | 647                | 518   | 569   | 586   | 419   |      |      |      |      |      | 567         | 462       | 606       | 653       | 534       |
| 3    | pH_FLD (pH units)                 | 7.8                | 7.8   | 7.3   | 7.9   | 7.9   |      |      |      |      |      | 7.3         | 8.0       | 7.4       | 7.7       | 7.7       |
| 4    | pH_GEN (pH units)                 | 8.3                | 8.6   | 8.4   | 8.0   | 8.1   |      |      |      |      |      | 7.9         | 8.6       | 8.4       | 8.0       | 8.1       |
| 5    | TDS (mg/L)                        |                    |       |       | 352   | 251   |      |      |      |      |      |             |           |           | 366       | 306       |
| 6    | Temp (deg C)                      | 28.6               | 29.2  | 28.0  | 27.8  | 26.3  |      |      |      |      |      | 20.9        | 21.9      | 20.9      | 19.9      | 23.5      |
|      | <b>CHEMICAL</b>                   |                    |       |       |       |       |      |      |      |      |      |             |           |           |           |           |
| 1    | Alk-Phen (mgCaCO3/L)              | 16.8               | 31.9  | 25.9  | 2.0   | 0.0   |      |      |      |      |      | 37.1        | 22.4      | 26.9      | 2.0       | 2.2       |
| 2    | ALK-TOT (mgCaCO3/L)               | 240                | 274   | 209   | 177   | 93    |      |      |      |      |      | 585         | 482       | 204       | 228       | 112       |
| 3    | B (mg/L)                          | 0.00               | 0.04  | 0.00  | 0.01  | 0.01  |      |      |      |      |      | 0.00        | 0.08      | 0.04      | 0.00      | 0.02      |
| 4    | Ca (mg/L)                         | 20                 | 55    | 43    | 43    | 34    |      |      |      |      |      | 47          | 48        | 42        | 46        | 34        |
| 5    | Cl (mg/L)                         | 40.2               | 42.0  | 69.4  | 50.8  | 35.8  |      |      |      |      |      | 40.0        | 37.0      | 65.9      | 53.0      | 46.0      |
| 6    | CO3 (mg/L)                        | 20.2               | 38.4  | 31.2  | 2.4   | 0.0   |      |      |      |      |      | 44.8        | 27.0      | 32.4      | 2.4       | 2.7       |
| 7    | F (mg/L)                          | 0.15               | 0.59  | 0.38  | 0.51  | 0.53  |      |      |      |      |      | 0.36        | 0.54      | 0.48      | 0.92      | 0.53      |
| 8    | Fe (mg/L)                         | 0.0                | 0.4   | 0.3   | 0.2   | 0.2   |      |      |      |      |      | 0.1         | 0.8       | 0.2       | 0.1       | 0.2       |
| 9    | HCO3 (mg/L)                       | 252                | 256   | 192   | 211   | 113   |      |      |      |      |      | 345         | 266       | 183       | 274       | 131       |
| 10   | K (mg/L)                          | 4.4                | 5.4   | 8.4   | 5.1   | 5.3   |      |      |      |      |      | 4.8         | 6.5       | 8.1       | 3.2       | 6.3       |
| 11   | Mg (mg/L)                         | 33.0               | 37.6  | 25.2  | 23.9  | 16.2  |      |      |      |      |      | 36.8        | 35.8      | 24.7      | 54.0      | 17.1      |
| 12   | Na (mg/L)                         | 34.8               | 54.4  | 51.9  | 35.9  | 22.8  |      |      |      |      |      | 57.0        | 53.3      | 47.4      | 38.0      | 28.7      |
| 13   | NH3-N (mg N/L)                    | 0.05               | 0.05  | 0.05  | 0.05  | 0.05  |      |      |      |      |      | 0.05        | 0.05      | 0.05      | 0.05      | 0.05      |
| 14   | NO2+NO3 (mg N/L)                  | 0.54               | 2.62  | 1.74  | 0.14  | 0.33  |      |      |      |      |      | 0.36        | 0.03      | 0.69      | 0.02      | 0.54      |
| 15   | NO2-N (mgN/L)                     | 0.01               | 0.01  | 0.00  | 0.02  | 0.02  |      |      |      |      |      | 0.00        | 0.01      | 0.01      | 0.01      | 0.12      |
| 16   | NO3-N (mgN/L)                     | 0.53               | 2.61  | 1.74  | 0.12  | 0.31  |      |      |      |      |      | 0.36        | 0.02      | 0.68      | 0.01      | 0.42      |
| 17   | P-Tot (mgP/L)                     | 0.002              | 0.061 | 0.009 | 0.047 | 0.001 |      |      |      |      |      | 0.004       | 0.049     | 0.044     | 0.001     | 0.027     |
| 18   | SiO2 (mg/L)                       | 11.5               | 11.5  | 8.5   | 8.9   | 8.2   |      |      |      |      |      | 10.7        | 10.2      | 8.8       | 11.1      | 8.1       |
| 19   | SO4 (mg/L)                        | 36.4               | 23.4  | 28.2  | 22.3  | 46.5  |      |      |      |      |      | 31.0        | 27.0      | 20.6      | 54.2      | 36.3      |
|      | <b>BIOLOGICAL/BACTERIOLOGICAL</b> |                    |       |       |       |       |      |      |      |      |      |             |           |           |           |           |
|      | <b>TRACE &amp; TOXIC</b>          |                    |       |       |       |       |      |      |      |      |      |             |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Flood     |      |      |      |      |      |      |      |      |      | Wier      |           |           |           |           |
|------|-------------------------|-----------|------|------|------|------|------|------|------|------|------|-----------|-----------|-----------|-----------|-----------|
|      |                         | Jun - Oct |      |      |      |      |      |      |      |      |      | Nov       |           |           |           |           |
|      |                         | 2006      | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|      | <b>CHEMICAL INDICES</b> |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |
| 1    | HAR_Ca (mgCaCO3/L)      | 50        | 137  | 108  | 106  | 84   |      |      |      |      |      | 118       | 121       | 104       | 114       | 85        |
| 2    | HAR_Total (mgCaCO3/L)   | 188       | 294  | 213  | 206  | 152  |      |      |      |      |      | 271       | 270       | 208       | 339       | 156       |
| 3    | Na% (%)                 | 27        | 28   | 34   | 27   | 24   |      |      |      |      |      | 31        | 30        | 32        | 20        | 27        |
| 4    | RSC (-)                 | 1.5       | 0.1  | 0.0  | 0.0  | 0.0  |      |      |      |      |      | 1.8       | 0.0       | 0.0       | 0.0       | 0.0       |
| 5    | SAR (-)                 | 1.1       | 1.4  | 1.6  | 1.1  | 0.8  |      |      |      |      |      | 1.5       | 1.4       | 1.4       | 0.9       | 1.0       |
|      | <b>PESTICIDES</b>       |           |      |      |      |      |      |      |      |      |      |           |           |           |           |           |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters                 | Winter    |           |           |           |           | Summer    |      |       |       |       |       |       |       |       |       |
|------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |                            | Jan - Feb |           |           |           |           | Mar - May |      |       |       |       |       |       |       |       |       |
|      |                            | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008 | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  |
|      |                            |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
|      | PHYSICAL                   |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
| 1    | EC_FLD (µmho/cm)           | 515       | 520       | 620       | 520       | 710       | 747       | 643  | 620   | 600   | 600   | 610   | 600   | 624   | 720   | 770   |
| 2    | EC_GEN (µmho/cm)           | 505       | 510       | 612       | 518       | 702       | 733       | 608  | 611   | 592   | 599   | 600   | 594   | 612   | 716   | 761   |
| 3    | pH_FLD (pH units)          | 7.7       | 7.8       | 8.0       | 8.0       | 7.5       | 7.3       | 8.0  | 7.1   | 8.1   | 7.5   | 7.7   | 8.0   | 8.2   | 8.0   | 7.2   |
| 4    | pH_GEN (pH units)          | 7.8       | 8.0       | 8.2       | 7.9       | 7.6       | 7.8       | 8.4  | 8.3   | 8.3   | 7.8   | 7.9   | 8.2   | 8.4   | 7.9   | 7.3   |
| 5    | TDS (mg/L)                 | 290       | 296       | 328       | 298       | 420       |           |      |       | 296   | 336   | 306   | 310   | 252   | 430   | 460   |
| 6    | Temp (deg C)               | 25.0      | 24.5      | 22.0      | 26.0      | 23.0      | 22.7      | 21.8 | 22.0  | 22.8  | 25.5  | 24.5  | 23.0  | 23.5  | 26.0  | 25.0  |
|      | CHEMICAL                   |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
| 1    | Alk-Phen (mgCaCO3/L)       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 33.2      | 19.9 | 23.2  | 19.9  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 2    | ALK-TOT (mgCaCO3/L)        | 88        | 112       | 156       | 196       | 228       | 332       | 317  | 240   | 256   | 148   | 140   | 144   | 168   | 232   | 252   |
| 3    | B (mg/L)                   | 0.04      | 0.04      | 0.03      | 0.03      | 0.04      | 0.02      |      | 0.00  | 0.00  | 0.01  | 0.03  | 0.03  | 0.04  | 0.04  | 0.04  |
| 4    | Ca (mg/L)                  | 47        | 48        | 52        | 47        | 59        | 50        | 48   | 49    | 42    | 51    | 51    | 51    | 59    | 61    | 66    |
| 5    | Cl (mg/L)                  | 24.0      | 26.0      | 40.0      | 52.0      | 60.0      | 38.0      | 35.3 | 79.2  | 52.9  | 30.0  | 34.0  | 32.0  | 44.0  | 70.0  | 72.0  |
| 6    | CO3 (mg/L)                 | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 40.0      | 24.0 | 28.0  | 24.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 7    | F (mg/L)                   | 0.44      | 0.45      | 0.41      | 0.44      | 0.54      | 0.80      |      | 0.23  | 0.81  | 0.42  | 0.43  | 0.43  | 0.44  | 0.56  | 0.59  |
| 8    | Fe (mg/L)                  | 0.1       | 0.3       | 0.2       | 0.2       | 0.3       | 0.1       |      | 0.2   | 0.2   | 0.2   | 0.2   | 0.3   | 0.3   | 0.3   | 0.3   |
| 9    | HCO3 (mg/L)                | 107       | 137       | 190       | 239       | 278       | 236       | 257  | 236   | 264   | 181   | 171   | 176   | 205   | 283   | 307   |
| 10   | K (mg/L)                   | 6.0       | 8.0       | 8.0       | 9.0       | 11.0      | 4.3       | 6.3  | 8.3   | 5.9   | 7.0   | 8.0   | 6.0   | 11.0  | 12.0  | 12.0  |
| 11   | Mg (mg/L)                  | 16.8      | 16.6      | 18.4      | 29.3      | 35.1      | 32.9      | 37.3 | 29.0  | 141.5 | 14.7  | 14.1  | 14.6  | 19.9  | 36.0  | 39.0  |
| 12   | Na (mg/L)                  | 32.0      | 34.0      | 26.0      | 32.0      | 44.0      | 60.7      | 56.7 | 52.9  | 51.4  | 22.0  | 24.0  | 28.0  | 24.0  | 48.0  | 52.0  |
| 13   | NH3-N (mg N/L)             | 0.05      | 0.05      | 0.05      | 0.00      | 0.00      | 0.05      |      | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.05  | 0.00  | 0.00  |
| 14   | NO2+NO3 (mg N/L)           | 0.43      | 0.41      | 0.60      | 0.42      | 0.53      | 0.22      |      | 0.34  | 0.04  | 0.63  | 0.62  | 0.04  | 0.61  | 0.54  | 0.54  |
| 15   | NO2-N (mgN/L)              | 0.14      | 0.13      | 0.00      | 0.12      | 0.14      | 0.00      |      | 0.00  | 0.03  | 0.00  | 0.00  | 0.00  | 0.00  | 0.14  | 0.15  |
| 16   | NO3-N (mgN/L)              | 0.29      | 0.29      | 0.60      | 0.29      | 0.39      | 0.22      |      | 0.34  | 0.01  | 0.63  | 0.62  | 0.04  | 0.61  | 0.41  | 0.40  |
| 17   | P-Tot (mgP/L)              | 0.001     | 0.001     | 0.021     | 0.020     | 0.024     | 0.004     |      | 0.024 | 0.001 | 0.001 | 0.001 | 0.001 | 0.020 | 0.026 | 0.028 |
| 18   | SiO2 (mg/L)                | 7.9       | 8.0       | 8.3       | 7.9       | 8.5       | 14.7      |      | 8.3   | 8.5   | 8.3   | 8.2   | 8.2   | 8.5   | 8.6   | 8.8   |
| 19   | SO4 (mg/L)                 | 32.0      | 36.0      | 52.0      | 38.0      | 48.0      | 24.7      | 28.5 | 21.6  | 16.9  | 36.0  | 42.0  | 40.0  | 46.0  | 52.0  | 55.0  |
|      | BIOLOGICAL/BACTERIOLOGICAL |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |
|      | TRACE & TOXIC              |           |           |           |           |           |           |      |       |       |       |       |       |       |       |       |

# Water Quality Seasonal Average for the period: 2006-2016

Station Name : DUDDHI ( GGT3OE8)

Local River : Kanhar

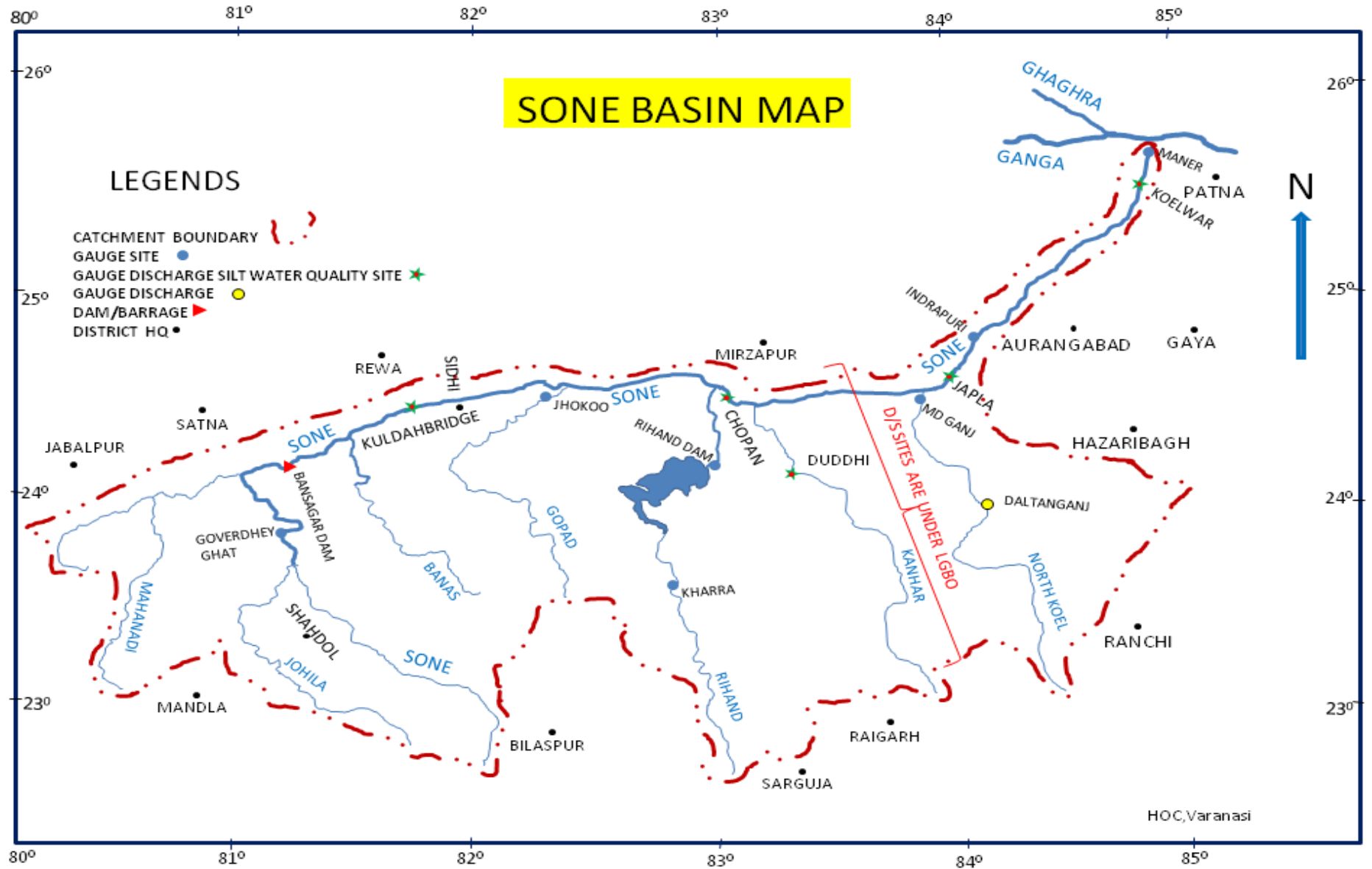
Well Water

Division : M Ganga Div. III, Varanasi

Sub-Division : U Sone Rehand SD, Rewa

| S.No | Parameters              | Winter    |           |           |           |           | Summer    |      |      |      |      |      |      |      |      |      |
|------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|------|------|
|      |                         | Jan - Feb |           |           |           |           | Mar - May |      |      |      |      |      |      |      |      |      |
|      |                         | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2007      | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|      | <b>CHEMICAL INDICES</b> |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |
| 1    | HAR_Ca (mgCaCO3/L)      | 119       | 119       | 130       | 119       | 148       | 125       | 121  | 123  | 105  | 128  | 127  | 127  | 147  | 152  | 164  |
| 2    | HAR_Total (mgCaCO3/L)   | 189       | 189       | 206       | 241       | 295       | 262       | 276  | 244  | 695  | 189  | 186  | 188  | 230  | 302  | 327  |
| 3    | Na% (%)                 | 26        | 27        | 21        | 22        | 24        | 33        | 30   | 31   | 21   | 20   | 21   | 24   | 18   | 25   | 25   |
| 4    | RSC (-)                 | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.3       | 0.0  | 0.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 5    | SAR (-)                 | 1.0       | 1.1       | 0.8       | 0.9       | 1.1       | 1.6       | 1.5  | 1.5  | 1.1  | 0.7  | 0.8  | 0.9  | 0.7  | 1.2  | 1.3  |
|      | <b>PESTICIDES</b>       |           |           |           |           |           |           |      |      |      |      |      |      |      |      |      |

# Index Map



## ABBREVIATIONS AND SYMBOLS

|         |                                                    |
|---------|----------------------------------------------------|
| N       | : North                                            |
| E       | : East                                             |
| sq. km. | : Square Kilometre                                 |
| m       | : Metre                                            |
| o       | : Degree                                           |
| '       | : Minute                                           |
| ”       | : Second                                           |
| SP      | :Sodium Percentage                                 |
| RSC     | : Residual Sodium Carbonate                        |
| SAR     | : Sodium Adsorption Ratio                          |
| HAR     | : Hardness                                         |
| mg/l    | : Milligram per Litre                              |
| ml.     | : Millilitre                                       |
| pH      | : Negative Logarithm of Hydrogen Ion Concentration |