

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

# Comparative Study of Drinking Water Quality Assessment of Municipal Corporation Area in Rewa district, and in Satna district (M. P.) India

Pooja Tripathi<sup>1</sup>, Pragya Dwivedi<sup>1</sup>, S. K. Singh<sup>2</sup>, Manju Pandey<sup>2</sup> and Paras Mani Choubey<sup>3</sup>

M. Phil Student, Department of Chemistry, Govt. T. R. S. College, Rewa, India<sup>1</sup>

Professor, Department of Chemistry, Govt. T. R. S. College, Rewa, India<sup>2</sup>

Research Scholar, Department of Chemistry, A. P. S. U., Rewa, India<sup>3</sup>

**ABSTRACT:** Fresh water is a critical, finite, vulnerable, renewable natural resource on the earth and plays an important role in our living environment without it life is impossible. In this paper we are analyzed to monthly variation and comparative physio-chemical study of Municipal Corporation in Rewa district, and Municipal Corporation Area in Satna district (M. P.). Monthly variation in physical and chemical parameters like Temperature, pH, total solids, total dissolved solids, total hardness, chlorides, calcium, magnesium, biological oxygen demand and chemical oxygen demand etc.

**KEYWORDS:** Water and Physico-Chemical Parameters.

### I. INTRODUCTION

Water is one of the most important and abundant compounds of the ecosystem. All living organisms on the earth need water for their survival and growth. As of now only earth is the planet having about 70% of water. But due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity it is highly polluted with different harmful contaminants. Therefore it is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro - biological relationship. (1)

Groundwater quality depends on the quality of recharged water, atmospheric precipitation, inland surface water and sub-surface geochemical processes. Temporal changes in the origin and constitution of the cause periodic changes in groundwater quality. Water pollution not only affects water quality but also threatens human health, economic development and social prosperity. (2)

In the present study samples have been collected over a period of one year i.e. 2017 during rainy seasons from the area nearby Municipal Corporation in Rewa and Satna. The ground water quality is being collected from the tube wells and wells available there by used for drinking as well as industrial and agricultural applications.

### II. MATERIALS AND METHOD

Rewa district is located on latitude 24.30 to 24.35 and longitude 81.20 to 81.30. The area receives about 1100 mm annual rainfall mainly from the southwest monsoon and enjoys subtropical to humid climatic condition. The temperature goes up to 43°C in summer and 4°C in winter season. Satna district is located on latitude 23.58 to 25.12

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

and longitude 80.21 to 81.23. The area receives about 1000 mm annual rainfall mainly from the southwest monsoon and enjoys subtropical to humid climatic condition. The temperature goes up to 45<sup>0</sup>C in summer and 6<sup>0</sup> C in winter season. Geologically, the study area forms a part of Vindhayn Supergroup.

Water samples have been collected from different tube wells. The water level shows a drastically change. The water samples were collected in stenciled bottles (polyethylene bottles). The test for pH, turbidity, water temperature and alkalinity has been carried out using multi functional water.

### III. RESULTS AND DISSCUSION

Water being the vital element of life, maintenance of a good water quality is highly essential for human wellbeing. Ground water has several applications in the field of cooking, domestic uses, industrial applications, agricultural utility and many more. Due to its purity and rich nutrient and mineral contain, ground water is preferred as a major source in the form of purist form of water (4).

The selected Parameters and trace metals in all water samples i.e. pH, conductivity, Fe and Mg were analyzed using pH meter, conductivity cell and Atomic Absorption Spectrophotometer. The entire data obtained is being tabulated in Table-1 and 2 as mentioned herewith. pH is a term used to indicate alkalinity or acidity of substance. The pH value of all water samples are recorded within the limits of 5.4-6.0 for drinking water in Rewa and 5.6-6.2 in Satna.

Turbidity is recorded in higher side for all water samples beside desirable limit of 5.0 NTU. Turbidity is the cloudiness of a fluid by large numbers of individual particles that are generally invisible to naked eye. In drinking water the higher the turbidity level the higher the risk that people may develop gastrointestinal diseases. The turbidity value of all water samples are recorded within the limits of 5.9-6.8 for drinking water in Satna and 6.2-6.9 in Rewa. The conductivity varies between 375-380  $\mu$ s/cm in Satna and 373-375  $\mu$ s/cm in Rewa. The total dissolve solid is found to be in the range of 385-415 mg/l in Rewa and 388-418 mg/l in Satna (5). Total solid ranges from 502-507 mg/l which is higher than (BIS 2012) 510 mg/l for drinking water in Satna. The recorded value of chloride is rang 245-254 mg/l for all water samples which is higher prescribed limit 250 mg/l. The recorded value of total hardness in all water samples is higher the prescribed limit of BIS 2012. Value of Ca hardness ranges from 85-96 mg/l and Mg hardness ranges from 85-120 mg/l.

Table 1 – Parameters of water analysis of Rewa region in Rainy session

Parameters	WS - 1	WS -2	WS -3	WS -4
pH	5.4	5.8	5.6	6.0
Conductivity( $\mu$ s/cm)	375	380	373	379
Total solid (mg/l)	495	504	505	500
Total dissolved solid (mg/l)	385	400	410	415
Temperature ( <sup>0</sup> C)	12	14	12	15
Turbidity	6.9	6.4	6.2	6.3
BOD	125	130	128	122
DO	10.3	11.1	9.3	9.2
Nitrate (mg/l)	47	48	52	42
Chlorides (mg/l)	250	249	253	251
Total hardness of water (mg/l)	305	302	306	309
Ca – hardness (mg/l)	85	90	92	89
Mg – hardness (mg/l)	105	115	85	115

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

Table 2 – Parameters of water analysis of Satna region in rainy session

Parameters	WS – 1	WS -2	WS -3	WS -4
pH	5.8	5.6	6.2	5.9
Conductivity( $\mu$ s/cm)	380	378	375	376
Total solid (mg/l)	502	510	508	500
Total dissolved solid (mg/l)	388	401	415	418
Temperature ( $^{\circ}$ C)	14	15	12	12
Turbidity	6.8	5.9	6.0	6.1
BOD	130	135	125	128
DO	10.0	11.5	10.6	10.2
Nitrate (mg/l)	49	50	58	52
Chlorides (mg/l)	245	252	254	250
Total hardness of water (mg/l)	300	305	302	306
Ca – hardness (mg/l)	88	92	96	90
Mg – hardness (mg/l)	110	112	105	120

### IV. CONCLUSION

The above study concluded that the ground water sources near by the ash pond are getting highly contaminated due to the leaching of different metals and toxic elements into the ground water sources. Keeping in view the health of plants, animals and human beings adequate measures are to be taken to get rid of ground water pollution. When compared results of Rewa and Satna, we observed tremendous increase in magnitude of Physico-Chemical parameters. Our observations suggest that, Industrial area especially in case of thermal power plants needs regular monitoring of water sources.

### REFERNCES

- Mishra, U.K., Tripathi, A.K., Tiwari Saras and Mishra Ajay. Assessment of Quality and pollution potential groundwater around Dabhaura area, Rewa Districts Madhya Pradesh India. Earth Science Research. 1(2):249-261, 2012.
- Milovanovic M. Water quality assessment and determination of pollution sources along the Axios/ Vardar River, Southeastern Europe. Desalination, 213: 159-173, 2007.
- Piper, A.M.A. "Graphical Procedure in the Geochemical Interpretation of Water Analysis, U.S geological survey of ground water", 1953.
- Biasiolim, M., Barberis, R. and Ajmone-marsan, F. Influence of a large city on some soil properties and metals content. The Science of the Total Environment, 356, 154, 2006.
- Mishra U. K., Tripathi A. K., Mishra Ajay, Mishra S.K. and Dwivedi Rashmi. (2013). Assessment of physico-chemical parameter of Limestone mineral water near J.P. cement plant Rewa District M.P. IJESI, 2(7): 58-68, 2013.