

PHYSICO-CHEMICAL CHARACTERISTICS OF GROUND WATER NEAR HOLY RIVER SHIPRA

Dr. Parag Dalal

Prof. Ujjain Engineering College, Ujjain mail- paragdadal@rediffmail.com

ABSTRACT: Generally the ground water is one of the most purified form of water but many areas are been affected by anthropogenic activities. A study says that since 1960 the amount of nitrate has increased much in ground water levels of India. The excess of it in food chain causes the gastro-intestinal problems and urinary tracts. Large use of fertilizers has affected the quality of ground water also in this. So in this study we take the bank of river Shipra and initialize the ground water analysis around it.

Key words: Gastro-intestinal, urinary tracts, ground water, Shipra.

INTRODUCTION

As we all know about 97 percent of the water is of oceans which are hardly used by humans for any use. The fresh water sources are only 2.5 percent of the whole water on the earth and out of this only 13 percent can be used for drinking purposes.

MATERIAL AND METHODS

The Ujjain district of M.P. (India) is situated at 23.182778°N 75.777222°E. The areas of Ujjain town are about 67 sq. Kms. and lies at about 54 Kms from Indore. The ground sample stations are located in different directions of Ujjain town and are near to agriculture farms. Water samples are collected for analysis on weekly basis from January to December and the parameters are analyzed as per the standard methods given by APHA.

RESULTS AND DISCUSSIONS

The Physico-chemical analysis of water samples is depicted in following tables 1 and 2. The pH value of all sampling stations varies between 7.1 and 8.4. The turbidity NTU ranges between 2.0 and 20.3. It is observed that sampling stations near to farms have higher value due to muddy surrounding areas. The TDS value can disturb the ecological balance and can cause suffocation in aquatic fauna. It varies from 409 to 1723. The TDS value of ground water sample near farms is to 2 to 3 times more than the other sampling points.

Table-1: Sampling locations

S.No.	Parameters	Sampling stations opposite Shipra river							
		1	2	3	4	5	6	7	8
1	pH	7.1	7	8	7.9	7.6	7.7	7.6	8.2
2	Turbidity	1.8	3.1	6.2	9.6	8.1	3.8	4.5	5.6
3	Conductivity	625	714	678	940	885	855	895	660
4	TDS	450	408	594	740	786	792	610	726
5	Hardness	185	199	312	384	308	441	405	372
6	Alkalinity	192	186	2543	282	318	358	248	305
7	Chloride	147	136	96	104	175	135	196	141
8	Sulphate	60	55.8	61	58.4	50.2	30.8	30	20
9	Nitrates	12	14	21.1	13.2	22.1	21.7	26.2	24.9
10	phosphate	0.13	0.09	0.04	0.03	1.1	0.02	0.09	0.07
11	fluoride	0.47	0.52	166	0.49	0.46	0.37	0.34	0.27
12	Total coliform	27	36	600	160	35	156	150	23
13	Faecal coliform	4	3	17	14	11	4	3	13

The hardness ranges between 200 and 2500mg/L which follow the same trend. The higher value of hardness affect human health adversely and also hard water cannot be used domestic and irrigation purposes. Similarly chlorides, sulphates, nitrates, phosphates and fluoride follow a similar trend of having higher value near the surface gives the adverse effect in domestic purposes. Here the representations of tabular data are the combined average of the samples taken at that particular time. The samples are taken at 09:00 a.m. and 03:00 p.m. daily for each eight stations.

Table-2: Sampling locations

S.No.	Parameters	Sampling stations near Shipra river							
		1	2	3	4	5	6	7	8
1	pH	7.1	7.3	7.4	8.1	7.8	7.9	7.72	7.77
2	Turbidity	20	20.4	18.8	19.4	5.16	11.2	15.6	5.13
3	Conductivity	1449	1540	1545	1632	2480	2532	996	1130
4	TDS	1004	862	800	892	1603	711	1632	735
5	Hardness	702	715	786	806	2166	2979	2530	842
6	Alkalinity	286	304	408	458	375	425	525	420
7	Chloride	380	484	392	322	426	502	323	287
8	Sulphate	160	158	124	122	192	54	58	61
9	Nitrates	60	64	54	71	58	68	60	49
10	phosphate	1.1	1.2	1.4	1.8	0.9	1	1.1	1.3
11	fluoride	0.5	0.52	0.62	0.44	0.46	0.48	0.54	0.50
12	Total coliform	110	80	62	82	70	68	45	50
13	Faecal coliform	nil	1	2	4	nil	27	34	2

CONCLUSION

It can be concluded that sampling stations near Shipra River have higher density of chemical fertilizers w.r.t. opposite side. Our water resources were very rare and their establishment and maintenance are very essential so the use of fertilizers should be limited.

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