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Physico-Chemical Parameters of Ground Water At Bhanpura Bhopal (M.P)

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ABSTRACT
Only 2.5% of earth's water is fresh water, 98.8% of the water is in ice and ground water. This makes it an important resource which can act as a natural storage that can buffer against shortages of surface water as in during times of droughts. Certain problems have beset the use of ground water around the whole area of Bhanpur which a town in the city of Bhopal. The samples were collected from 10 different sites covering the entire area of Bhanpur mostly from Hand pumps and Tube wells in the post and pre monsoon seasons. Physico chemical parameters viz Colour, Turbidity, Conductivity, ph, chloride, calcium, Fluoride, Sulphide, Magnesium, Nitrate, and TDS were analyzed. The study clearly revealed that the concentration of most of the parameters is below and above the maximum permissible limits.
KEYWORDS: physico-chemical parameters, concentration, permissible, buffer, concentration

1. INTRODUCTION

Water covers 71% of the earth's surface and is vital for all known forms of life. It is a chemical compound with chemical formula H_2O.The human body contains from 55% to 78% of water depending on body size. To function properly the body requires between 1 to 7 liters of water per day to avoid dehydration. The precise amount depends on the level of activity, temperature, humidity and other factors. Ground water is the major source of drinking water in both urban and rural areas. Besides it is an important source for many other purposes like agriculture, transportation, and recreation, industrial and so on. People in Bhanpura have designed various methods to withdraw underground water for their daily needs. Dug wells, tube wells, hand pumps, are some of the methods used to extract ground water. As per the study the quality of ground water has been contaminated due to the excess disposal of solid wastes at the disposal site Bhanpur. Water contamination refers to any type of foreign particle or impurity which makes water bodies poisoned or toxic and hence harmful for living organisms and all forms of life .The pollutants are directly or indirectly discharged into the water bodies without adequate treatment to remove harmful compounds. The extent of pollution in ground water has been studied at the selected ground water bodies at Bhanpura Bhopal which is the main disposal site of municipal solid waste Bhopal.

2. MATERIALS AND METHODS

The present investigation deals with the study of variation of physical and chemical parameters of ground water due to solid waste disposal in Bhanpur. For this ground water samples were collected in washed polypropylene bottles of 250ml size from 10 sites covering mainly the disposal site area of Bhanpur. The details of samples site is given in the table 1. The samples were collected in the pre-monsoon and post-monsoon seasons of 2012.

Table 1: DETAILS OF SAMPLING STAION

S.NO	LOCALITY	SAMPLING STATION
1	MOHALI -1	**ST-1**
2	MOHALI-3	**ST-2**
3	DAMBAKHEDA-1	**ST-3**
4	DAMBAKHEDA-2	**ST-4**
5	BHANPURA RIGHTSIDE UNDER BRIDGE	**ST-5**
6	SATYA NARAYAN SWAMI	**ST-6**
7	PATEL NAGAR MAIN ROAD-1	**ST-7**
8	PATEL NAGAR MAIN ROAD-2	**ST-8**
9	PANDIT G WATER SUPPLY	**ST-9**
10	PATRA RIVER	**ST-10**

3. RESULT AND DISCUSSION

All the investigations were carried out in the year 2012-2013.mostly the water samples were analyzed between the pre-monsoon and post-monsoon seasons. The sites that were selected for analysis were those where municipal solid waste is disposed off without any treatment. It was been observed that hand pump is the only

source of drinking water in most of the areas of that site and only few areas use tap water. In the discussion the sampling code for hand pump is H with the number of sampling stations like H_1, H_2, H_3 etc and for tube well as T_1 T_2 T_3 and for tape water as Tw-1, Tw-2 etc .The results of the present study and the details of physical and chemical parameters of ground water of Bhanpur are given in table 2.

Table-2 : Physico-Chemical parameters of Ground water at Bhanpur(Pre-Monsoon)

S. NO	SAMPLING STATION	SOURCE	COLOUR Pt/Co scale	TURBIDITY NTU	CONDUCTIVITY Micro/cm	pH pH scale	CHLORIDE Mg/l	FLOURIDE Mg/l	CALCIUM Mg/l	SULPAHTE Mg/l	MAGNESIUM Mg/l	NITRATE Mg/l	TDS Mg/l
1	ST-1	T-1	colourless	2.8	1242	7.6	190	0.30	125	25.5	58	25	732
2	ST-2	H-1	colourless	2.2	1325	7.5	450	0.30	135	38.4	53	142	750
3	ST-3	T-2	colourless	5.5	1363	7.8	300	0.18	145	35.2	95	81.9	890
4	ST-4	T-3	colourless	5.8	1382	7.6	280	0.25	125	37.9	86	18.9	825
5	ST-5	H-2	colourless	2.9	1261	7.7	175	0.25	172	13.9	24	29.8	716
6	ST-6	Tw-1	whitish	2.0	1012	7.4	195	0.29	138	25.3	55	7.2	530
7	ST-7	H-3	colourless	3.8	1125	7.2	172	0.28	120	25.9	49	10.5	640
8	ST-8	H-4	Slighty hazy	4.4	1064	7.7	174	0.23	132	25.4	44	8.0	710
9	ST-9	T-3	colourless	2 .7	875	7.7	184	0.32	186	28.0	49	1.6	575
10	T-10	R	Slightly coloured	2.1	1146	7.7	174	0.23	123	24.5	82	16.8	598

Physico-Chemical parameters of Ground water at Bhanpur Bhopal (Post-Monsoon)

S.NO	SAMPLING STAION	SOURCE	COLOUR pt/Co	TURBIDITY NTU	CONDUCTIVITY Micro/cm	pH pH scale	CHLORIDE Mg/l	FLOURIDE Mg/l	CALCIUM Mg/l	SULPHATE Mg/l	MAGNESIUM Mg/l	NITRATE Mg/l	TDS Mg/l
1	ST-1	T-1	colourless	3	1107	7.7	184	0.47	131	27.3	55	24.3	715
2	ST-2	H-1	colourless	3	2042	7.6	370	0.21	140	32.9	55	150	685
3	ST-3	T-2	colourless	2.7	1405	7.6	295	0.23	143	37	89	20	936
4	ST-4	T-3	colourless	2.7	1374	7.7	276	0.20	133	37	88	19.1	881
5	ST-5	H-2	colourless	3	1124	7.5	188	0.22	192	13.5	30	35	804
6	ST-6	Tw-1	colourless	1.7	1019	7.7	233	0.29	154	25	57	8.6	653
7	ST-7	H-3	Slightly hazy	4.8	1092	7.6	181	0.30	138	27.3	41	9.8	696
8	ST-8	H-4	Slightly hazy	4.8	1113	7.6	178	0.24	143	27.2	44	9.1	702
9	ST-9	T-3	colourless	2.0	911	7.8	186	0.28	186	30.5	77	2.6	565
10	ST-10	R	Slightly greenish	1.9	1158	7.6	179.5	0.26	127	29.3	92	17.5	674

4. CONCLUSION

As per the Investigation done on the parameters of ground water quality of Bhanpur Bhopal the conclusion drawn was that the ground water of most of the area was alkaline in nature. The pH of ground water of the area under investigation was under the desirable limits of WHO and BIS. The higher value of turbidity was noted in hand pumps of Dambhakheda during pre monsoon seasons. Among all the studied samples of ground water H -1 contained higher amount of nitrates in both the seasons during the study period. These values were found higher than the permissible limits of WHO and BIS. Few samples contain hardness higher than the permissible limits. Other factors like TDS, Fluorides, and Sulphates were found to be in the permissible limits of WHO. Improper solid waste management gives rise to problems of health, sanitation and environmental degradation. WHO has recognized that 22 diseases are directly linked to improper solid waste management practices. Rodents and vector insects transmit various diseases like dysentery, cholera, plague, typhoid, infective, hepatitis and others. However, the parameters were not so high to cause acute toxicity and serious health hazard, but long term effects

cannot be ruled out.

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