Research Article

Analysis of Ground Water Quality in Aurangabad District (M.S.)

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ABSTRACT

Ground water has been the primary source of water supply for domestic, agriculture and industrial uses. 18% of the drinking water required in rural areas and 50% in urban areas. Naturally ground water contains mineral ions. There ions slowly dissolve from soil particles, sediments and rocks as the water travels among mineral surface in the pores of the unsaturated zones and the aquifer. They are referred to as dissolved solids. The quality of ground water depends on varies chemicals constituents and their concentration. Ground water quality parameters such as ph, Alkalinity, Salinity, dissolved Oxygen, Chloride, Sulphate, Hardness are analyzed in order to assess water quality. Ground Water quality tested for each tahsil four Villages selected for sampling.

Keywords: Ground Water Quality, DO,BOD

INTRODUCTION

Groundwater is an important natural resource and also a crucial element not only in dry land areas but also in meeting the rapidly increasing demands of growing population and improved living standards. Ground water has been the primary source of water supply for domestic, agricultural and industrial uses in Maharashtra. It is the single largest and most readily available source contributes to almost eighty percent of the drinking water requirements in rural areas, fifty percent of urban water requirements and more than fifty percent of the irrigation requirements of the nation.

OBJECTIVES

The prime objective of this research paper is to assess the Ground Water Quality in Aurangabad District (M.S.).

METHODOLOGY

To checkout the chemical quality of ground water of the samples in the Aurangabad district, researcher has collected the samples of 36 wells from various tahsils of Aurangabad District. (Total 36 - 4 from each tahsils) from fixed locations and gave it to MGM Water Testing Lab. On the basis of examination of water, the parameter - wise analysis has given.

ANALYSIS

Naturally, ground water contains mineral ions. These ions slowly dissolve from soil particles, sediments, and rocks as the water travels along mineral surfaces in the pores or fractures of the unsaturated zone and the aquifer, they are referred to as dissolved solids. Some dissolved solids may have originated in the precipitation water or river water that recharges the aquifer.

The results of groundwater quality obtained from the lab is given in table 1

Table 1 - Chemical Quality of Groundwater in Aurangabad district (MS)

Sr. No.	Tahsil	Location of Sample Water	Color	Odor	Appearance	pH	Total Hardness as CaCO3	Total Alkality as CACO3	Total Dissolved Solids (TDS)	Chloride as Cl-	Turbidity	Nitrate as NO3	Fluoride as NO3	Iron as Fe	Suitability for Drinking
1	Aurangabad	Jatwada	5	Agreeable	Clear	7.4	640	399	915	174	0.7	45.97	1.231	BDL	NS
2	Aurangabad	Daulatabad	15.4	Odourless	Clear	7.9	368	260	550	38	0.89	Nd	Nd	Nd	NS
3	Aurangabad	Shendra	8.9	Odourless	Clear	7.55	845	542	1146	324	0.57	49	0.45	Nd	NS
4	Aurangabad	Kumbhepal	12.7	Odourless	Clear	7.6	751	684	1473	396	0.68	195	0.31	Nd	NS
5	Gangapur	Gangapur	4.5	Agreeable	Clear	7.18	1056	133	1719	589	0.7	46.45	0.872	BDL	NS
6	Gangapur	Bhivdhanora	12	Agreeable	Clear	7.74	400	228	534.8	168.29	0.4	14.42	1.11	BDL	NS
7	Gangapur	Gawalishivara	4.5	Agreeable	Clear	7.65	248	186.2	288.2	86.1	0.5	19.65	0.798	BDL	NS
8	Gangapur	Turkabad	16.5	Agreeable	Turbid	7.59	220	159.6	313.4	117.41	7.8	3.93	0.228	0.023	NS
9	Kannad	Hatnur	8.88	Agreeable	Coloress	7.19	1100	384.75	1669	242.16	0.9	47.59	0.965	BDL	NS
10	Kannad	Kannad	23.92	Agreeable	Colorless	7.27	515	194.75	716.5	183.45	2.7	44.19	0.69	BDL	NS
11	Kannad	Chapaner	11.2	Agreeable	Colorless	7.67	210	275.5	314.8	44.03	0.6	2.97	0.82	BDL	NS
12	Kannad	Pishor	15.54	Agreeable	Colorless	7.61	190	213.75	269.7	41.58	1.1	7.44	0.792	BDL	NS
13	Khulatabad	Galleborgaon	73.73	Agreeable	Colorless	8.15	175	693.5	917	85.61	0.7	33.08	1.27	BDL	NS
14	Khulatabad	Loni	16.06	Agreeable	Colorless	7.79	200	285	376	48.92	0.4	4.94	0.86	BDL	NS
15	Khulatabad	Khultabad	25.76	Agreeable	Colorless	7.79	290	294.5	371.7	48.92	0.9	4.23	0.52	BDL	NS
16	Khulatabad	Golegaon	10.5	Odourless	Clear	7.08	400	248	520	90	0.33	2.5	Nd	Nd	NS
17	Paithan	Paithan	7.14	Agreeable	Clear	7.92	500	646	1298	338.53	0.6	46.02	0.75	BDL	NS
18	Paithan	Bidkin	6.12	Agreeable	Clear	7.25	220	133	247	78.27	0.7	6.88	0.076	BDL	NS
19	Paithan	Vihamandva	4.2	Agreeable	Clear	7.68	252	254.6	344.4	72.4	0.3	7.74	2.02	BDL	NS
20	Paithan	Adool	6	Agreeable	Clear	7.35	300	323	297.2	52.83	0.9	10.58	1.21	BDL	NS
21	Phulambari	Phulambari	5	Agreeable	Clear	7.62	360	334	566	97.84	0.9	44.79	0.626	BDL	NS
22	Phulambri	Khamgaon	30.4	Odourless	Clear	7.1	1160	332	1646	304	0.23	16.1	0.4	0.2	NS
23	Phulambri	Aland	10.5	Odourless	Clear	7.52	464	260	522	40	0.18	5	0.15	0.01	NS

Sr. No.	Tahsil	Location of Sample Water	Color	Odor	Appearance	pH	Total Hardness as CaCO3	Total Alkality as CACO3	Total Dissolved Solids (TDS)	Chloride as Cl-	Turbidity	Nitrate as NO3	Fluoride as NO3	Iron as Fe	Suitability for Drinking
24	Phulambri	Peerbawda	7.8	Odourless	Clear	7.65	416	188	550	38	0.29	1.95	0.19	0.02	NS
25	Sillod	Sillod	21.8	Odourless	Clear	7.29	888	364	1272	184	0.17	18	0.21	0.21	NS
26	Sillod	Nillod	16.2	Odourless	Clear	7.62	380	304	594	60	0.27	1.95	0.18	0.01	NS
27	Sillod	Shivna	5	Odourless	Clear	6.9	580	400	922	92	0.29	5.1	Nd	Nd	NS
28	Sillod	Ghatnandra	18.4	Odourless	Clear	8	456	304	670	52	0.86	3.2	Nd	Nd	NS
29	Soegaon	Jarandi	35.8	Odourless	Clear	7.16	368	296	440	20	0.08	2.5	Nd	Nd	NS
30	Soegaon	Soegaon	9	Odourless	Clear	7.06	480	1720	2368	126	0.69	42.01	0.21	0.19	NS
31	Soegaon	Sawladbara	41.8	Odourless	Clear	7.18	292	440	532	20	0.23	1.95	Nd	Nd	NS
32	Soegaon	Banoti	23.7	Odourless	Clear	7.01	304	232	435	24	0.25	3.5	Nd	Nd	NS
33	Vaijapur	Vaijapur	6.4	Agreeable	Clear	7.51	480	406	870	299	1.8	47.46	0.614	BDL	NS
34	Vaijapur	Shirasgaon	5	Agreeable	Clear	7.85	584	399	797.8	318.96	0.5	41.52	0.691	BDL	NS
35	Vaijapur	Shivrai	7.15	Agreeable	Clear	7.55	320	239	362.2	62.62	1	44.74	0.028	BDL	NS
36	Vaijapur	Shivoor	8.5	Agreeable	Clear	7.22	156	152	251	70.44	1.3	3.03	0.86	BDL	NS

Source: Lab Reports of Water Samples

Table 1 reveals the following observations.

- The color of sample underground water seems to be ranges from 4.2 hazen to 73.73 hazen. As per the standards, the hazen score below 5 hazen is considered as good and usable water. Out of 36 selected samples, only 7 samples have shown below 5 hazen color whereas 29 samples have shown above 5 hazen results.

- From 36 villages / places of the Aurangabad district shows that, the water was odourless / agreeable. The sample was taken from well and bores. So it was odorless / agreeable.

- The pH value of sample water ranges from 6.9 (Shivna village) to 8.15 (Galleborgaon village). Above 8 pH value was received from two villages only whereas 33 samples have shown 7.01 to 7.92 pH value.

- Regarding total hardness of water, out of 36 samples, there is only 4 samples which comes in standard scale and other 32 are above the standard level. It clearly indicates that, More than 90% of samples are not as per the standards.

- In regard with alkalinity, It is noted that, almost samples have show the value less than 500 mg/L. About 31 samples have shown alkalinity value less than 500 mg/L where 500 to 1000 mg/L have been received from the 4 samples. Only one sample of Soygaon has shown the alkalinity value of 1720 mg/L.

- Regarding TDS, It is noted that, 23 samples have shown the value more than standards, i.e. 500 mg/L. About 13 samples have shown TDS value less than 500 mg/L where 500 to 1000 mg/L TDS have been received from the 15 samples. Only 8 samples have shown the TDS value of more than 1000 mg/L. It clearly indicates that, this kind of water is suitable for drinking purpose.

- The chloride of ground water samples varies from 20 mg/L for Sawaldbara (Soygaon Tahsil) to 589 mg/L for Gangapur (Tahsil Gangapur). This is also the highest and lowest figures for the same. Below 100mg/L chloride from ground water samples have been observed from 22 samples whereas 6 samples have shown the values of above 100 mg/L chloride.

- Turbidity value of ground water ranges from 0.08 NTU to 7.8 NTU. It shows that, it is highest for the sample of Turkabad (Gangapur tahsil) whereas lowest for Jarandi (Soygaon tahsil). The standard value for turbidity is 1 NTU. The lab result indicates that, there are only 5 samples which are above the standard values whereas 31 values are below the standard value.

- Nitrate in the ground water ranges from 1.95 mg/L for Sawaldbara (Soygaon tahsil) to 195 mg/L for Kumbefal (Aurangabad tahsil). It means the nitrate in water has been highest in Kumbefal and lowest in Sawaldbara ground water.

- The fluoride in the ground water ranges from 0.028 mg/L from Shivrai (Vaijapur tahsil) to 2.02 mg/L from Vihamandwa (Paithan tahsil). It means the highest nitrate in ground water has been noticed from the sample of Shivrai village whereas least has been noticed from the sample of Vihamandwa village. The standard value for nitrate in ground water is 1 mg/L.

- Iron has been detected from only 7 samples out of 36 whereas 29 sample are below detection level. It means there is negligible level of iron in the samples. Among 7 detected sample, the iron ranges from 0.01 mg/L for Aland (Phulambri tahsil) to 0.21 mg/L for Sillod city (Sillod tahsil). The standard level of iron in ground water is upto 1 mg/L.

CONCLUSION

After checking all the chemical parameter of ground water quality, based on the results, researcher has come to know that, the ground water samples (All 36) are not suitable for drinking purpose.

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