

# Assessment of Ground Water Quality in Urban Area.

Swaraj.P.Chini.<sup>1</sup> Udith.k.Ashoka.<sup>2</sup> Punith.m.Kumar.<sup>3</sup> Samrudh.A.<sup>4</sup> M.C.Sampath Kumar.<sup>5</sup>.

<sup>1,2,3,4</sup> Department of civil engineering, BMS College of engineering Bengaluru

<sup>5</sup>Professor Department of civil engineering, BMS College of engineering Bengaluru.

## Abstract

The objective of the study was to assess the quality of ground water in the study area in Bangalore.

With the increasing scarcity of water supply in Bangalore, the feasibility of harvesting and ground water to satisfy Bangalore's water requirements has been explored.

The water samples collected from the study area were examined for parameters : pH, turbidity, chlorides, acidity, alkalinity and TDS

## 1. Introduction

Planning and Execution of water resource project required to assess the ground water quality in the study area. The preliminary tests were conducted on the samples collected as per the IS code standards. Sampling of ground water was done according to IS standards and composite samples were collected. The results obtained were assessed and compared with the standards.

## 2. Description of the study area

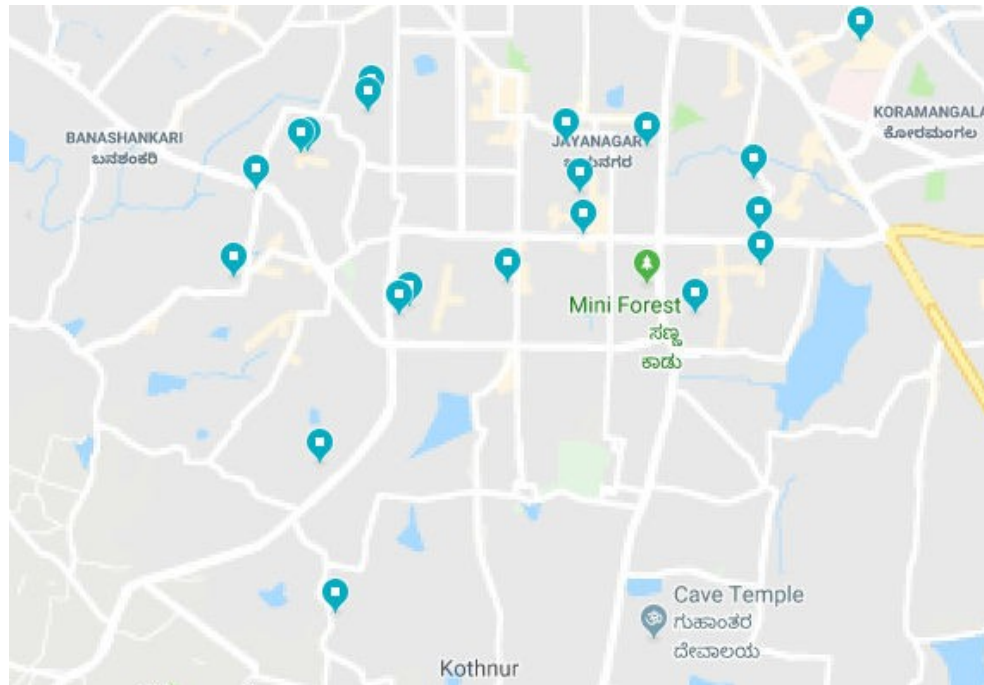
The Jayanagar Area located in southern part of Bengaluru was selected as the base point and the study area was extended to radius of 6Km around the base point. The study area selected was based on the severity of depletion of the ground water quality in recent years and the present quality was assessed. The ground water was assessed for a season and variation in the quality over days were also noted.

## 3. Methodology

The sampling was done according to IS 3025 and composite samples were collected for an entire week. The samples collected were tested for pH, turbidity, chlorides, acidity, alkalinity and TDS as per IS 3025 standards. The study area was divided into 8 equal parts and sampling was done at 3 points in the subdivided area.

Table no.1 Location of ground water sample points

Sample no.	Address
1	Shiva lingeshwara swamy manidra,38th main road,JP nagar 1st phase
2	Srinivas Babu residence,5th main road,Banashankari
3	10th A main road,Sarakki gate,Sarakki,bengaluru south
4	AK Colony,2nd cross,Konankunte,Benagluru south
5	opposite DG hospital,Padmanabanagar
6	Kariyanna Palya village ,Banashankari 2nd stage
7	no.1204,16th main,BTM 2nd stage
8	Ashwathakatte,Taverekere circle,Taverekere
9	5th cross road,Mallappa reddy layout,8th block,Koramangala
10	38th cross,16th main,4th T block Jayanagar,Marenhalli
11	Vittal Mallya scientific research foundation,KR road,Bengaluru south
12	7th cross,6th main,BTM 2nd stage,NS palya
13	13th main road,Sarakki,JP nagar 1st phase
14	AK Nagaraj residence,JP nagar 2nd phase
15	10th cross,15th main,Banashankari 2nd stage
16	10th main road,opp.Kerela ayurveda,Banashankari 2nd stage
17	opposite Swagath garuda mall,Tilaknagar
18	11th main road,BTM 2nd stage
19	opp. Central Mall,Shivaram residence ,Jayanagar 9th Block
20	Kumarans pu college,Padmanabanagar



**Table. 2. Sampling Details for analysis of General Parameters of Groundwater.**

Sampling Day	Sampling Date
Day 1	Nov 24,2018 - Saturday
Day 2	Nov 25,2018 - Sunday
Day 3	Nov 26,2018 - Monday
Day 4	Nov 27,2018 - Tuesday
Day 5	Nov 28,2018 - Wednesday
Day 6	Nov 29,2018 - Thursday
Day 7	Nov 30,2018 – Friday

**Table.No.3 Results of analysis of general parameters of ground water–**

	Ph	Alkalinity mg/L	Calcium mg/L	Magnesium mg/L	Dissolved Oxygen mg/L	Chloride mg/L
SAMPLES						
Sample 1	6.57	264	54	13	4.4	82
Sample 2	8.1	311	55	50	4.7	70
Sample 3	6.48	262	65	6	4.8	116
Sample 4	6.28	88	46	14	5.5	78
Sample 5	6.84	331	84	7.35	5.7	135
Sample 6	6.97	411	108	38	7.5	111
Sample 7	7.32	95	19	13	7.8	50
Sample 8	6.3	127	21	11	7.4	54
Sample 9	6.7	242	65	26	5.6	120
Sample 10	7	120	30	10	4.5	44
Sample 11	6.8	200	76	31	6.4	115
Sample 12	6.25	54	11	8	4.6	34
Sample 13	6.9	240	59	20	7.7	64
Sample 14	6.5	56	12	4	6.8	23
Sample 15	6.8	220	40	11	7.5	40
Sample 16	7.6	260	55	27	5.5	55
Sample 17	7.2	125	15	11	7.6	48
Sample 18	6.5	210	16	9	4.8	33
Sample 19	6.2	90	63	7	4.6	114
Sample 20	6.7	325	80	7.5	6.4	130

Table.No.4 Results of analysis of of ground water

TESTS	Ph	Alkalinity	Calcium	Magnesium	Dissolved Oxygen	Chloride
SAMPLES		mg/L	mg/L	mg/L	mg/L	mg/L
Sample 1	6.58	161	55	15	4.4	84
Sample 2	8.09	308	57	50	4.6	74
Sample 3	6.45	255	65	6	4.5	118
Sample 4	6.24	85	48	15	5.6	74
Sample 5	6.5	333	87	32	5.7	132
Sample 6	6.91	416	113	37	6	112
Sample 7	7.35	93	21	9	7.7	50
Sample 8	6.32	131	20	10	7.8	51
Sample 9	6.5	245	65	28	5.9	125
Sample 10	7.05	125	27	7	4.8	43
Sample 11	6.64	205	79	33	6.7	118
Sample 12	6.26	57	14	8	4.4	30
Sample 13	6.95	243	57	22	7.4	62
Sample 14	6.4	54	12	4	6.4	21
Sample 15	6.82	215	41	10	7.5	42
Sample 16	7.67	265	51	24	5.6	56
Sample 17	7.32	140	19	13	7.8	50
Sample 18	6.25	215	11	8	4.6	34
Sample 19	6.48	93	65	6	4.5	116
Sample 20	6.28	320	46	14	6.5	78

Table No.5 Results of analysis of ground water

TESTS	Ph	Alkalinity	Calcium	Magnesium	Dissolved Oxygen	Chloride
SAMPLES		mg/L	mg/L	mg/L	mg/L	mg/L
Sample 1	6.59	261	55	15	4.8	83
Sample 2	8.11	311	54	48	4.7	72
Sample 3	6.43	258	63	6	5	111
Sample 4	6.3	91	45	12	5.2	76
Sample 5	6.85	329	81	34	5.9	136
Sample 6	6.92	411	112	36	7.7	115
Sample 7	7.45	96	19	10	7.5	49
Sample 8	6.5	130	18	11	7.4	52
Sample 9	6.42	241	24	23	5.7	122
Sample 10	7.02	125	27	6	4.7	46
Sample 11	6.63	199	80	30	6.3	112
Sample 12	6.3	62	14	6	4.5	29
Sample 13	6.98	248	57	23	7.5	65
Sample 14	6.43	50	13	3	6.9	22
Sample 15	6.85	214	45	11	7.4	45
Sample 16	7.75	260	53	25	5.4	55
Sample 17	7.46	131	20	11	7.8	52
Sample 18	6.28	51	15	8	4.7	32
Sample 19	6.6	91	77	31	4.6	131
Sample 20	6.25	328	42	10	6.6	69

#### 4. Conclusions

On testing the samples it was observed that, Samples 6,7,8,13,15 and 17 were found to have dissolved oxygen to satisfactory limits and Samples 3,4,8,12,19 have pH values outside desirable limits. The other parameters were found to be within the permissible limits.

The analysis of groundwater from Jayanagar, Yedyur, JP nagar, Tilak nagar, Koramangala, BTM layout, Konankunte, Padmanabanagar has shown that much of the samples are fit, unfit for drinking. The analysed data clearly indicates that the groundwater is getting polluted at an alarming rate due to rapid urbanization.

The results reveal that most of the study area is highly polluted because of one or more water quality parameters. Replacing of damaged pipelines and lining of sewer drains is necessary to prevent the leakage of sewage in pipes and seepage through lined channels and to prevent mixing and leaking of sewage with ground water

Water treatment facility should be designed in order to provide potable water to the residents of that area and also to meet the ever-increasing need of potable groundwater. The best way is to protect the ground water by protecting it from pollution and augmenting it with groundwater resources by recharging it with rain water harvesting.

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