

## WATER QUALITY OF HISTORICAL WELLS IN PERIPHERY OF SUDHAGADFORT

Dr. Puranik Anjali S<sup>1</sup>. and Mr. Puranik Salil S<sup>2</sup>

<sup>1&2</sup>Sheth J. N. Paliwala Commerce, Science and Arts College, Pali

**Abstract:** Like Sindhudurg district, Sudhagad taluka is also a hilly and rainy area. Being historical place, the villages are observed with centuries old wells and lakes. A survey among 'water quality' of thirteen wells for ten parameters has led us to conclude that the water is still safe and drinkable according to parameters defined by WHO.

**Key Words:** Water analysis, well water, Sudhagad.,

### INTRODUCTION

Our ancestors had knowledge and vision to create and maintain the essentials for mankind. Water, also called as 'Jeevan' is the most important one. Research here pertains to the name 'Sudhagad' the fort which is 2200 years old. obviously, its periphery was a residential area those days. The drinking water resources were the wells and lakes constructed centuries before whilst a few of them are still in use. To examine the water from such resources, sample were collected by random sampling method and were tested for some important parameters as mentioned in water quality index.

Table I includes the typical parameters and the range defined by WHO pertaining to safe water<sup>1</sup>. All the procedures used in laboratory are from the guidelines published by WHO. Total hardness<sup>2</sup> and alkalinity<sup>3</sup> are determined by titration methods. pH<sup>4</sup> and TDS<sup>5</sup> are noted by pH-meter and TDS- meter respectively. Sodium<sup>6</sup> and potassium<sup>7</sup> were determined flame-photometrically. Sulfate<sup>8</sup> was estimated by using nephelometer and chloride<sup>9</sup> by turbidimeter using calibration curve method. Sulfite<sup>10</sup> was determined iodometrically. COD<sup>11</sup> was estimated in place of BOD due unavailability of chemicals in situ. Presence of E- coli was tested using commercially available kit.

Table No. 1

No.	Parameter	Well water	Limit
1	Hardness	28 - 84 mg/L eq. of CaCO <sub>3</sub>	600 mg/L eq. of CaCO <sub>3</sub>
2	pH	06.60- 07.20 mg/L	6.5 - 8.5
3	TDS	55 - 144	500 mg/L
4	Alkalinity	27.00 - 173.00 mg/L eq. of CaCO <sub>3</sub>	20-600 mg/L eq. of CaCO <sub>3</sub>
5	COD	0.32 - 3.08	Under 5 for BOD
6	Potassium (K <sup>+</sup> )	0.00-23.25 mg/L	300 mg/L*
7	Sodium (Na <sup>+</sup> )	0.00-25.00 mg/L	250 mg/L*



8	Sulphite	0.00 mg/L	0.05 mg/L
9	Sulfate	0.40–06.96 mg/L	400
10	Chloride	6.75–16.21 mg/L	1000 mg/L

**Table No. 2**

No.	GPS Co-ordinates	Source	Location	Hardness	pH	TDS	Alkalinity	COD
1	18°32'07.1"N 73°13'27.4"E	Well	Pali, Sudhagad	64	6.9	102	50	2.54
2	18°50'50.9"N 73°12'28.8"E	Well	Talavli, Khalapur	79	6.8	95	120	1.93
3	18°27'12.0"N 73°09'28.0"E	Well	Devkahne, Roha	55	6.8	96	90	1.74
4	18°39'58.4"N 73°18'35.6"E	River	Karchunde, Sudhagad	28	6.8	55	60	1.74
5	18°55'48.4"N 73°02'40.6"E	Well	Jambhulpada, Sudhagad	33	6.9	63	50	0.48
6	18°34'35.0"N 73°07'29.3"E	Well	Palas, Roha	34	6.7	70	40	2.9
7	18°31'44.0"N 73°11'04.0"E	Well	Rabgaon, Sudhagad	46	6.6	89	173	3.3
8	18°52'37.2"N 73°14'59.1"E	Well	Asare, Sudhagad	62	6.7	124	65	3.08
9	18°31'45.0"N 73°13'21.5"E	Well	Burmali, Sudhagad	84	7	144	90	3.3
10	18°35'59.3"N 73°15'49.1"E	Well	Bherav, Sudhagad	54	6.8	126	115	0.64
11	18°31'45.6"N 72°57'12.7"E	Well	Nidi, Murud	31	6.6	93	45	1.2
12	18°30'52.0"N 73°11'42.1"E	Well	Tamsoli, Roha	44	6.5	79	27	0.32
13	18°27'05.5"N 73°10'52.7"E	Lake	Chilhe, Roha	63	7.2	108	41	2.4

**Table No. 3**

No.	GPS Co-ordinates	Source	Location	K+	Na+	Sulfite	Sulphate	Chloride
1	18°32'07.1"N 73°13'27.4"E	Well	Pali, Sudhagad	0.5	0	0.00	3.03	13.11
2	18°50'50.9"N 73°12'28.8"E	Well	Talavli, Khalapur	0.75	25	0.00	5.63	11.64
3	18°27'12.0"N 73°09'28.0"E	Well	Devkahne, Roha	0.75	8	0.00	0.07	15.29
4	18°39'58.4"N 73°18'35.6"E	River	Karchunde, Sudhagad	0.25	5	0.00	0.43	17.48
5	18°55'48.4"N 73°02'40.6"E	Well	Jambhulpada, Sudhagad	0	6.5	0.00	0.14	6.75
6	18°34'35.0"N 73°07'29.3"E	Well	Palas, Roha	0.75	9.5	0.00	1.15	15.57
7	18°31'44.0"N 73°11'04.0"E	Well	Rabgaon, Sudhagad	2.75	8.75	0.00	2.27	16.21
8	18°52'37.2"N 73°14'59.1"E	Well	Asare, Sudhagad	18	14.25	0.00	2.13	11.81

9	18°31'45.0"N 73°13'21.5"E	Well	Burmali, Sudhagad	0	24.75	0.00	1.23	11.69
10	18°35'59.3"N 73°15'49.1"E	Well	Bherav, Sudhagad	23.25	14	3.20	1.48	14.49
11	18°31'45.6"N 72°57'12.7"E	Well	Nidi, Murud	60	11.75	0.00	0.40	13.78
12	18°30'52.0"N 73°11'42.1"E	Well	Tamsoli, Roha	0.5	5.75	1.60	6.96	12.26
13	18°27'05.5"N 73°10'52.7"E	Lake	Chilhe, Roha	73	3.6	1.60	0.61	11.72

## CONCLUSION

The historical wells which are in use till now are tested for quality of water. All the thirteen wells sampled were found to contain 'drinkable' water according to parameters defined by WHO.

1. Guidelines for drinking-water quality third edition incorporating the first and second addendums volume 1 recommendations by World Health Organization Geneva (2008)
2. Tarek Zieneldien, Determining the Hardness of Various Water Samples, *CHM* 2046 L 11 (2018)
3. Massimiliano Magro, Livio Corain, Silvia Ferro, Davide Baratella, Emanuela Bonaiuto, Milo Terzo, Vittorino Corraducci, Luigi Salmasso, and Fabio Vianello, Alkaline Water and Longevity: A Murine Study *Evidence-Based Complementary and Alternative Medicine* 2016(3) 1155 (2016)
4. Kanokvalai Kulthanan, Piyavadee Nuchkull, Supanya Varothai, The pH of water from various sources: an overview, *Asia Pac Allergy*; 3(3)155 (2013)
5. Rubiat Islam, Shaikh Md. Faysal, Md. Ruhul Amin, Farha Matin Juliana, Mohammad Johirul Islam, Md. Jahangir Alam, Mohammad Nazir Hossain and Mohammad Asaduzzaman Assessment of pH and Total Dissolved Substances (TDS) in the Commercially Available Bottled Drinking Water, *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* 6(5) 35 (2017)
6. A. I. Vogel, Vogel's Textbook of Quantitative Chemical Analysis Longman; 5 edition (9 October 1989) ISBN-10: 9780582446939 (1989)
7. Michelle Ling Wang Jing, Siti Marwanis Anua, Nurzafirah Mazlan, Concentrations of Magnesium, Calcium and Potassium in Drinking Water; A Comparison between Tap Water and Bore Water *Journal of Energy and Safety Technology* 2(1) 01 (2019)
8. M. A. Tabatabai, A Rapid Method for Determination of Sulfate in Water Samples, *Environmental Letters* 7(3) 237 (1974)
9. J. Ramírez-Muñoz, Determination of chloride in natural and potable water samples by turbidimetric discrete-sample automatic analysis, *Analytica Chimica Acta* 74(2) 309 (1975)
10. Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association, Water Environment Federation (1999)
11. Priyanka Sharma and Dr. Sujata Gupta, Study of amount of Oxygen (BOD, OD, COD) in water and their effect on fishes, *American International Journal of Research in Formal, Applied & Natural Sciences* 4(343) 2328 (2014)

University of Mumbai



Associates



**State Level Conference**  
organised by

**Sindhu Swadhyay Sanstha**  
(University School of Integrated Aquatic Education)

hosted by  
University of Mumbai's

**Vijayalakshmi Vishwanath Dalvie College**  
(UGC/RUSA and Govt. of Maharashtra funded Model College)

**VISHWANATH SUMMIT**

Propriety of Global Wellness



**CERTIFICATE**

This is to certify that

Dr. Anjali S. Puranik actively presented a paper on 29<sup>th</sup> March, 2020 at 'VISHWANATH SUMMIT', a state level conference on "Management of Aquatic Health and Resources of Konkan, with Special Emphasis on Sindhudurg" virtually on track I entitled, 'Water Quality of Historical Wells around the Periphery of Sudhagad Fort'.

*[Signature]*

Dr. Ajay Deshmukh,  
Registrar, University of Mumbai,  
Secretary, Advisory Committee

*[Signature]*

Dr. Rajendra Singh,  
Water Man of India,  
Mentor, Organizing Committee