

## **Drinking Water Quality Assessment in Kala Bahian Region, Jalandhar, Punjab**

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### **Abstract**

Water and life are two sides of the same coin, since water sustains all life processes. The quality of water is of vital concern for mankind since it is directly linked with human health and environmental protection. In the present study, the physico-chemical characteristics of groundwater of region Kala Bahian were assessed for its suitability for drinking purposes. A total of ten water samples were collected from various areas. In order to assess the ground water quality, the water samples were analyzed for different physico-chemical prospects e.g. pH, electrical conductivity, Total dissolved solids (TDS), Dissolved Oxygen, Turbidity. The results were compared with standards prescribed by World Health Organization (WHO) and Bureau of Indian Standards (BIS). Study of all these characteristics indicate that in some of the studied areas water was polluted and not suitable for drinking purpose. The drinking water of the area needs some degree of treatment before consumption.

**KEYWORDS :-** Drinking water, WHO, BIS, Physicochemical parameters.

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### **Introduction**

Water is an elixir of life. Although three-fourth of earth is being surrounded by water but a little portion of it can be used for drinking purpose. The physical and chemical parameters of water play a significant role in classifying & assessing water quality<sup>1</sup>. It is the basic duty of every individual to conserve water resources. Good quality of drinking water is essentially needed for all people throughout the world.<sup>2</sup> The best quality potable water free from hazardous materials and contaminants must be available for the public to avoid diseases incidence and it is also used as a powerful environmental tool, required to determine the health of public. Good quality drinking water means removing the dangers related to water borne diseases<sup>3</sup>. Superior quality of water not only enhances human productivity but also add bonus days to human life. Pure water for human use is not always available naturally due to occurrence of suspended or dissolved impurities. Among the environmental pollutants, heavy metals are considered as more problematic.<sup>4</sup> Thus in this paper an attempt was made to assess the physico-chemical analysis of drinking water in the view of health of human beings living in this area.

### **Materials & Methods :-**

#### **Sample Collection**

Total 10 ground water samples areas were located samples were collected, covering the entire kala bahian area, from different 10 locations. Water samples were collected in sterilized polyethylene bottles of 200 ml capacity. The first sample was collected from Randhawa masanda road and the last sample was collected from nogazza road. Two different type of analysis were carried out. First was to check the variation of set

parameters and second analysis was to check season wise variation of set parameters which is still going on .

#### Analytical methods

The water samples were analyzed for pH ,electrical conductivity (EC),dissolved solids (TDS) ,dissolved oxygen (DO),turbidity .All the reagents used in present study were of analytical grade & de ionized water was used for experimental purpose .The instrument used for this purpose is

- 1) 7200-pH/mV/conductivity /TDS/salt/ temperature Water Proof Meter
- 2) PDO 519 Dissolve Oxygen Meter (pen type) auto calibration
- 3) TU -2016 Turbidity meter
- 4) 191 Water &Soil analysis kit

The details of sampling sites and results are presented in Table

LOCATION	Turbidity(NTU)	EC( $\mu$ S/cm)	TDS(mg/l)	pH	DO(ppm)
1.Main chowk	0.94	0.74	674.2	8.97	7.8
2.Peer shah jatan	0.72	0.83	429.8	8.99	6.9
3.Randhawa road	0.84	1.12	554.9	9.01	7.2
4.Bhatiza road	0.78	0.93	492.9	9.04	7.4
S.Randhawa masanda road	1.32	2.32	427.3	9.17	7.9
6.Nogazza road	0.83	1.92	738.1	9.18	6.8
7.Gurudwara road	0.94	0.92	433.6	9.09	6.4
8.Primary school	0.79	1.19	499.7	9.08	7.1
9.Floret public school	0.71	0.43	621.4	9.03	7.3
10.Charrhda pasa	0.98	0.71	749.2	9.09	6.9

#### Results & Discussion

*Hydrogen ion activity:*

pH is a term to express the intensity of acidic or alkaline conditions .It is the expression of hydrogen ion concentration ,more precisely the hydrogen ion activity pH is an important parameter in assessing the water quality .Acidic conditions will prevail as pH value decreases and alkaline conditions will prevail as pH value increases. The BIS limit for drinking water is 7.0-8.5 shown in table .pH value in the analyzed water samples varied from 8.97-9.17.The high pH value indicates change in taste of water .pH value above 7.0 shows the alkaline nature of water due to excess of carbonate and bicarbonate ions .

#### Electrical Conductivity (EC)

The ability of a solution to conduct an electrical current is governed by the migration of solutions and is dependent on the nature and numbers of the ionic species in that solution. This property is called electrical conductivity. It is a useful tool to assess the purity of water. The permissible limit for electrical conductivity (EC) is  $300 \mu\text{S cm}^{-1}$ . Throne and Throne suggested 6 conductivity classes

0.00-250 $\mu\text{S cm}^{-1}$	Low salinity water
250-750 $\mu\text{S cm}^{-1}$	Moderate salinity water
750-2250 $\mu\text{S cm}^{-1}$	Medium high salinity water
2250-4000 $\mu\text{S cm}^{-1}$	High salinity water
4000-6000 $\mu\text{S cm}^{-1}$	Very high salinity water
Above 6000 $\mu\text{S cm}^{-1}$	Water should not be used

EC of the collected samples ranged from 0.43-2.32 .

#### Total Dissolve Salts (TDS)

The electrical conductivity of water samples correlates with the concentration of dissolved minerals or with what is commonly known as the total dissolved salts of water sample.TDS is the calculation of inorganic salts and minute amounts of organic substances present in a water solution. The key compounds are usually calcium, magnesium, sodium and potassium cations and carbonate, hydrogen carbonate, chloride , sulphate and nitrate anions. Water which has TDS levels less than 600mg/l is regarded as good, while water having TDS more than 1000mg/l is unacceptable for human consumption. High TDS values are unacceptable because it imparts bitter taste or bad odour to drinking water as well as causing scaling of pipes and corrosion .

#### Turbidity

Turbidity is the measurement of relative clarity of water. Turbidity in water is due to presence of suspended substances like clay, silt and microscopic organisms and it can also be a source of nutrients for micro organisms. Maximum turbidity was found to be while the lowest values were found in sample 9. According to WHO and EPA turbidity must not exceed 5 NTUs and water having turbidity less than 1.00 NTUs is excellent for

domestic consumption. High turbidity cause problems during purification (flocculation and filtration ) and increases the treatment expenses. It also diffuses light and hence lowers the rate of photosynthesis and may cause plants death. Turbidity results of all the samples in the present study were in confirmation with the recommended levels that shows the suitability of tested water samples for drinking purpose

### **CONCLUSION:**

The area under study is having not good quality drinking water .Either the water is to be treated by some ways or a need of alternate source is required to meet the drinking water quality parameters .

### **References:-**

- [1] Dayal , gopal.1992.*J.Nature Conser*,4(1):89-93
- [2] De,A.K.1994, Environment chemistry (III ed ),New Delhi.
- [3] Manadevan ,A and Krishnaswamys.(1983)*Indian J.Environ Health*,Vol 21(4):288-292
- [4] Sajidu S.M; Masamba R. L ; Mwatseteza J.F;*Int .J,Physical sci.*,3(1)2008 p1-11.
- [5] World Health Organization , Guidelines for drinkingwaterqualityI,Recommendations.2<sup>nd</sup>.Ed. Geneva WHO (1993).