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VARIABILITY IN PHYSICO - CHEMICAL PARAMETERS DUE TO INDUSTRIAL EFFLUENTS ON WATER RESERVOIR NEAR BAHALA VILLAGE, MATSYA INDUSTRIAL AREA, ALWAR

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ABSTRACT

A study has been undertaken for three years for the determination of different physico chemical parameters of the water reservoir near Bahala Village Matsya Industrial area, Alwar. All the industrial effluents from Matsya Industrial area are released in this water reservoir. A total of seventeen parametres were studied and results have been presented. Most of the parameters such as nitrate, fluoride, hardness, total dissolved solids, BOD, COD etc had higher values than prescribed by WHO and ISI standards. This water is unfit for various purposes without treatment.

Keywords: *TDS, DO, BOD, COD, WHO.*

Introduction

The water discharged after use by industry is termed as industrial effluent. Organic pollutants decrease the dissolved oxygen impart bad order and colour to the effluent. The deleterious material and other impurities are dumped into the water bodies near Matsya industrial area (Trivedi and Goel 1987). Such water has a bad and offensive odour, turbidity, taste, high or low pH, high alkalinity or acidity ,dissolved solids, organic materials in the form of pesticides and metal pollutants (WHO Guidelines Geneva 1998).These constituents certainly affect aquatic life ,promote corrosion ,hardness and have a tendency for the formation of foam(Sharup, R., Mishra, N.and Jauhri, V.P.,1992).The main purpose of analysis of the industrial effluents is to evaluate the methods of treatment of the water, with the aim to reuse the dispose, ascertain quality of water and recovery of valuable products from waste effluents. The purpose of analysis is to assess the material balance for the process to permit evaluation of efficiency of the treatment. In order to ascertain the above objectives it is necessary to analyse various parametres, which would throw light on the quality of waste water.

Experimental Methodology

The water quality parameters are divided into three categories:

- Physical,
- Chemical,
- Bacteriological

Above parameters can be determined by APHA. Standard methods for the examination of water and waste water. (20th edition. Fifteenth, A. Publ. Health Ass. Washington DC 1998) and Manual for water and waste water analysis. (15th Refreshers training Course Sponsored by CPHEED, Ministry of Urban Development and Poverty Alleviation, Government of India New Delhi 2005).

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Results and Discussion

Pertaining to the above factors of various sites of MIA was done and their subsequent comparison was also done. The data regarding physico-chemical and bacteriological analysis of water samples collected during the four seasons for three years from different sources are given in table 1,2,3 (Kudesia V,P, 1980). The results were examined in the light of drinking water standards of IS: 10,500,1991(table). The parameters found in higher quantity are minimised using suitable and innovative methods.

The water of this source is black brown Mishra and Jauhari 1992 coloured and turbid. All the physical and chemical parametres are higher than the prescribed limits because all the industries in MIA are discharging untreated effluents in this water body. The values of chloride, nitrates, sulphates, dissolved solids, hardness and alkalinity are high. This shows that the presence of inorganic pollutants in water. The DO, BOD, and COD values are clearly indicating the presence of various organic pollutants in water .The water of this source is used for irrigation and thus affect the health of human and animals. The water of this reservoir is also polluting the other sources of surrounding areas, The odour coming out from the source is a nuisance to nearby areas, causing allergy bronchitis sinusitis inflammation and various other disease in human beings and animals.

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Table1: (Year 2017) Physico-Chemical and Bacteriological Analysis of Water Water Reservoir near Bahala Village, M.I.A., Alwar

Sr. No.	Parameters	Autumn	Summer	Monsoon	Winter
1	Colour	80	150	80	110
2	Oudour	Ob.	Ob.	Ob.	Ob.
3	Turbidity	20	20	50	30
4	pH	6.8	7.2	7.0	7.3
5	EC	8425	9140	8585	8935
6	Total Dissolved Solids	4716	5116	4810	5000
7	Total Hardness (as CaCO3)	1390	1680	1400	1520
8	Calcium Hardness (as CaCO3)	990	1010	900	980
9	Magnesium Hardness (as CaCO3)	400	670	510	540
10	Total Alkalinity (as CaCO3)	710	750	810	780
11	Chlorides (as Cl)	2100	2315	2210	2285
12	Nitrate (as NO3)	105	135	95	110
13	Fluoride (as F)	1.6	1.8	1.2	1.8
14	Sulphate (as SO4)	472	510	485	500
15	DO	0	0	0	0
16	BOD	110	135	210	180
17	COD	258	355	542	390
18	Total Coliform (MPN/100ml)	≥2400	≥2400	≥2400	≥2400

Colour (Hazen Units), turbidity (NTU), EC (micro mhos/cm), Ob. = objectionable, pH (Units), rest of value are in mg/l.

Table 2: (Year 2018) Physico-Chemical and Bacteriological Analysis of Water Water Reservoir near Bahala Village, M.I.A., Alwar

Sr. No.	Parameters	Autumn	Summer	Monsoon	Winter
1	Colour	70	140	120	130
2	Oudour	Ob.	Ob.	Ob.	Ob.
3	Turbidity	20	30	40	20
4	pH	7.0	7.4	7.1	7.2
5	EC	9460	10920	9825	10660
6	Total Dissolved Solids	5300	6112	5500	5917
7	Total Hardness (as CaCO3)	1850	2590	2020	2480
8	Calcium Hardness (as CaCO3)	1110	1580	1410	1650
9	Magnesium Hardness (as CaCO3)	740	1010	610	830
10	Total Alkalinity (as CaCO3)	950	1010	1000	1080
11	Chlorides (as Cl)	2205	2510	2380	2400
12	Nitrate (as NO3)	115	105	130	110
13	Fluoride (as F)	1.8	1.4	1.7	1.5
14	Sulphate (as SO4)	528	680	554	596
15	DO	0	0	0	0
16	BOD	250	280	355	270
17	COD	716	700	1056	780
18	Total Coliform (MPN/100ml)	≥2400	≥2400	≥2400	≥2400

Colour (Hazen Units), turbidity (NTU), EC (micro mhos/cm), Ob. = objectionable, pH (Units), rest of value are in mg/l.

Table 3: (Year 2019) Physico-Chemical and Bacteriological Analysis of Water Water Reservoir near Bahala Village, M.I.A., Alwar

Sr. No.	Parameters	Autumn	Summer	Monsoon	Winter
1	Colour	50	120	100	70
2	Oudour	Ob.	Ob.	Ob.	Ob.
3	Turbidity	30	40	50	30
4	pH	6.9	7.5	7.3	7.3
5	EC	12700	14035	11620	13690
6	Total Dissolved Solids	7100	7840	6500	7650
7	Total Hardness (as CaCO3)	2860	3280	2610	3120
8	Calcium Hardness (as CaCO3)	1860	1780	1610	1680
9	Magnesium Hardness (as CaCO3)	1000	1500	1000	1440
10	Total Alkalinity (as CaCO3)	1050	1200	960	1100
11	Chlorides (as Cl)	3115	3500	3010	3440
12	Nitrate (as NO3)	130	140	105	125
13	Fluoride (as F)	2.2	2.4	2.0	2.0
14	Sulphate (as SO4)	708	780	656	765
15	DO	0	0	0	0
16	BOD	550	610	725	700
17	COD	1413	1708	2125	1920
18	Total Coliform (MPN/100ml)	≥2400	≥2400	≥2400	≥2400

Colour (Hazen Units), turbidity (NTU), EC (micro mhos/cm), Ob. = objectionable, pH (Units), rest of value are in mg/l.