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Reckoning of ground water quality of villages adjoining Nimrana industrial area, Rajasthan

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ABSTRACT: The present study has been carried out to determine the effect of pollutant on ground water sources near the Nimrana block. Ten villages have been selected in this block for water sample collection and analysis. Hand pumps, open wells and tube wells have been taken as ground water sources.Parameters such as fluoride, pH, electrical conductivity (EC), total dissolved solid (TDS), total hardness (TH), chloride, Nitrate, Ca^{+2}, Mg^{+2}, total alkalinity (TA) were also determined. The result revealed that there was considerable variation among the analyzed samples in respect to chemical composition of water. Majority of samples do not comply with Indian as well as WHO guidelines for the most of water quality parameters measured.

INTRODUCTION:

The pollution of ground water is a slow but intrinsic process and it may take years together and lot of efforts to regain the natural quality of the ground water. Day by day the water caused diseases are increasing. Keeping this fact in mind the author has carried out the present investigations to assess the ground water hydrology status in industrial and typical urban area in the city of Nimrana. Industrial areas are the source of environmental stress the water quality of different study points was studied for the assessment of its suitability for drinking purposes.

MATERIAL AND METHODS:

The samples were collected during last week of July in clean polythene bottles and the following parameters were determined by standard methods (1,2) samples were collected from various hand-pumps, wells and tube-wells adjoining the Nimrana industrial areas. The standard values for different parameters are shown in table-1 (4) and compared with the obtained results.

RESULTS AND DISCUSSION:

The pollution of wells, hand-pumps, tube-wells and ground water bodies affect the socio-economic concentration of near by population and unless checked further the loss done to rural economy and human health may surpass the gains of industrial developments (Table-2). The chloride concentration varied from 175 mg/l to 450 mg/l, so 40% samples had high chloride concentration due to which taste and odour of water has changed. The Nitrate Concentration varied from 20 mg/l to 60 mg/l, which shows that 30% samples had high Nitrate concentration value which is dangerous to human health especially for infants below six months of age. The value of total dissolved solid varied from 492 mg/l to 2050 mg/l, so 90% samples had high values of TDS, which makes the water unsuitable for domestic as well as industrial purposes. All the samples had permissible fluoride concentration. Sulphate values are in the range of 160 mg/l to 360 mg/l, which shows that almost 60% samples had higher value of sulphate. Higher value of sulphate may cause diarrhoea in human beings as well as cattlesAlmost all the samples had higher values of Magnesium hardness, total hardness and total alkalinity. From the above results it has been concluded that the wells, tube-wells and hand-pumps are grossly polluted and worst affected. Remedial measures are required to sustain the good quality of water and save the live stock.

CONCLUSION:

People should be made aware of the ill effects of high concentration of these salts in waterDisposal of industrial waste water of industrial area in the surroundings without any treatment should be stopped immediately.

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TABLE-1: Drinking water standards as prescribed by World Health Organization, 1971

Parameters	Highest desirable (in mg/l)	Maximum permissible (in mg/l)
pH	7.0 - 8.5	6.5 - 9.2
Chloride	200	600
Nitrate	45	100
Fluoride	1.0	1.5
Total dissolved solid (TDS)	500	1500
Sulphate (as SO4)	200	600
Magnesium hardness (as CaCO3)	30	150
Total hardness (TH) (as CaCO3)	500	600
Total alkalinity (TA) (as CaCO3)	-	600

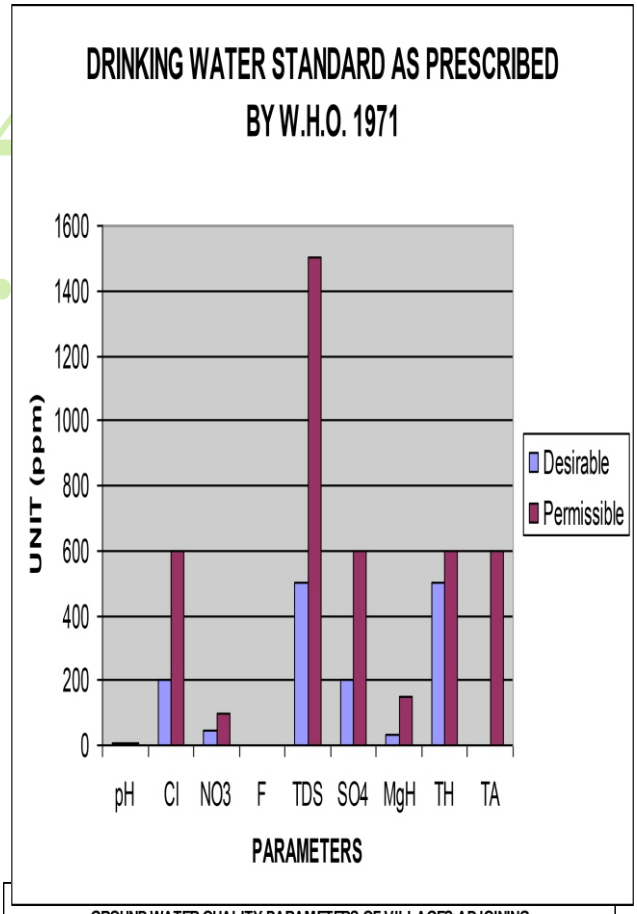

TABLE-2: Ground water quality parameters of villages adjoining Nimrana industrial area.

1.	Rodwal	7.6	400	60	1.4	2050	172	75	500	380
2.	Kolila	7.4	375	55	1.2	1800	210	60	510	400
3.	Bhinteda	6.9	200	35	1.2	600	255	50	480	510
4.	Chandichana	6.5	250	35	1.4	780	360	35	600	600
5.	Kankardopa	6.2	275	40	1.3	1130	160	75	400	480
6.	Gandala	7.8	450	48	1.6	492	340	32	700	350
7.	Majrikalan	7.6	400	30	1.3	1190	320	38	380	500
8.	Bhimpura	7.2	200	25	1.4	1120	280	50	485	540
9.	Sansedi	7.2	175	20	1.3	750	175	70	500	430
10.	Abalpur	6.8	190	25	1.5	800	310	65	450	400