



WATER QUALITY INDEX OF STORED WATER OF PANEM COAL MINES STORED WATER

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ABSTRACT:- Present study is focussed on the assessment of Water Quality Index (WQI) of Panem coal mines Panem coal mines is huge open cast coal mines present in Amrapara ,a block in Pakur district Jharkhand .After mining there is huge amount of water deposited in these mines .WQI decide the quality of water stored in open cast mines .It identifies the causative element and group of parameters responsible for deterioration of water quality .After calculation of WQI value of different water samples collected in different seasons of 2017 and 2018 it can be concluded that whether water can be used for irrigation and other purposes or cannot be used .

KEY WORDS:- WQI, P^H ,Open cast mines ,water quality parameter ,chemical pollutant.

INTRODUCTION: - Now a day's various research works are done on water analysis. Pakur is a remote dist of Jharkhand having many stone chips mines and coal mines .The mining of coal is done by Punjab electric board and it is open cast mining. After mining huge amount of water is deposited in these mines . Open cast mines produce dust and drainage of various impurities in It. These impurities may be organic or inorganic in nature. The impurities produce anti environmental effect. Now days the ground water table goes down every year. So it is a time to think for new water sources. The coal mines stored water can be a better option for it.

MATERIAL AND METHOD :- water samples are collected in three different seasons in 2017 and 2018 as per standard procedure recommended by APHA(2005). The samples were collected very carefully in double washed polythene bottle .samples were collected from different spot of the mines in different seasons. Temperature, p^H ,TDS, conductivity, DO were measured at the sampling site by using systronic model 161E other physico chemical parameter are measured in S.K.M.U .Dumka PG Department chemistry lab . And after analysis of data WQI value is calculated for various samples by the following formula :

$$W_i = w_i / \sum_{i=1}^n w_i$$

Where, W_i =Relative weight

W_i =weight of each parameters

n = no. of parameters

$$q_i = c_i / s_i \times 100$$

where q_i =quality rating

c_i = concentration of each chemical parameter in mg/l

s_i = Indian standard for drinking water

for computing of WQI value vthe S_{li} is determined first .

$$S_{li} = W_i \times q_i$$

$$WQI = \sum_{i=1}^n S_{li}$$



RESULT AND DISCUSSION: - The data and result obtained for various samples are given below:

A r e a	sea son	P ^H	qi	Do	qi	TDS	qi	TH	qi	Cl	qi	F	qi	So ₄ ²⁻	qi
		P a n e m	Pre - mo nso on	8.35	128.4 6	5.40	108.0	334	66.80	336	112	21.3 4	8.53	0.21	34.3
Mo nso on	7.73		118.9 2	6.81	136.2	279.7	55.90	316.7	105.5	18.9 5	7.58	0.11	17.5	28.39	18 .9 2
Pos t- mo nso on	7.72		118.7 6	6.35	127.0	290.7	58.10	350.1	116.6	22.3 6	8.94	0.21	34.2	34.68	23 .1 2
A r e a	sea son	NO ₃ ⁻	qi	Ca	qi	Mg	qi	Fe	qi	Na	qi	K	qi	As	qi
		P a n e m	Pre - mo nso on	2.29	5.08	73.53	98.08	37.56	125.2	0.006	2.00	12.9 0	6.45	3.59	11.9 6
Mo nso on	1.73		3.84	63.87	85.18	27.49	91.63	0.001	0.33	10.4 4	5.22	2.89	9.63	0.004	8. 0
Pos t- mo nso on	2.70		6.00	74.23	98.90	38.08	126.9	0.006	2.00	12.8 4	6.42	3.38	11.2 6	0.005	10 .0

Sub-Index values of all the Parameters and Water Quality Index of Different Samples:-

Area	Season	p ^H	DO	TD S	TH	Cl	F	SO ₄ ²⁻	NO ₃ ⁻	Ca	Mg	Fe	Na	K	As	WQI
Panem	Pre-monsoon	5.34	8.99	2.77	23.29	0.355	1.120	0.973	0.21	12.26	20.78	0.083	0.268	0.497	0.333	77.28
	Monsoon	4.95	11.34	2.32	21.95	0.315	0.248	0.787	0.16	10.64	15.21	0.014	0.217	0.400	0.333	68.87
	Post-monsoon	4.94	10.57	2.42	24.25	0.372	1.421	0.961	0.25	12.36	21.07	0.083	0.267	0.468	0.416	79.84

NOTE: WQI value <50 =excellent ,WQI value 50-100= good , WQI value 101-200= poor

CONCLUSION : the data obtained for various water samples collected from panem coal mines shows that WQI values are within the permissible range and this water can be used for various purpose like irrigation and other household works.

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