Design of Drinking Water Treatment Plant for Phursungi Village

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Abstract- This study deals with the problems which is originated due to Impure water. There are so many diseases which is spread due to consumption of impure water, so we are mainly focused on this issue so that it will helps to find out remedial measures. For this study we have selected Phursungi Town which has population 1.5 Lakh and Source of water is Khadakwasla D/S Canal. During this study we study the different water quality parameters such as Physical, Chemical, Biological. So by referring GOI manual we have fix the desired levels of all parameters and accordingly we have selected Treatment Process. All units of WTP is designed by referring Acceptable limits of Drinking water parameters.

Keywords- 1) WTP:- Water Treatment Plant. 2) D/S:- Down Stream.

I. INTRODUCTION

First of all, water industries are divided into three major types which are water purification, wastewater treatment and also the new type called desalination. For the water purification means purifying water to become the drinking water. Although natural water is drinkable for human but without any purification or method of killing gem, the natural water is harmful for human being nowadays. Purified water and natural water seems like no different when we look at it but sometimes we still smell the different, natural water might have some pungent smell. Natural water consists of a lot microorganism and bacteria inside it, just we can't observe it with our naked eyes. In addition, water pollution is getting serious thus purification is necessary to ensure the drinking water is clean and not harmful to our health.

1.1Present Scenario of water treatment at Phursungi:-

The Phursungi area was in grampanchayat till 2017 now it converted into city because of it presently at Phursungi there no any water treatment plant cumently this area consist 1.5lakh population which is use common domestic method such as boiling, alum addition, chlorine application which cannot give optimum purity level of potable water Now for

1.5 lakh population are planning to design water treatment plant to serve the Phursungi city with pure city.

II. LITEATURE REVIEW

- K . Sesha Maheswaramma, K. Satyanarayana, N.Babavali, K. Etheshamul Haq, K. Renuka, "Design of Water Treatment Plant To Pulivendula", Municipal Corporation of Kadapa.It helps to found some of the physical and chemical characteristics of raw water when found to be greater than permissible limit.
- 2. Mrs. Gang Liu, Mrs. Ya Zhang , Mrs. Willem-Jan Knibb , Mrs. Cuijie Feng , Mrs. Wentso Liu , Mrs. Gertjan Medema , Mrs. Walter van der Meer , " Potential impacts of changing supply-water quality on drinking water distribution".

Until now, no information has been available on the evaluation of the potential transition effects of the planned switching of supply-water quality, nor are there any proper guidelines for the avoidance of potential esthetic and health risks.

III. PROBLEM STATEMENT AND METHODOLOGY

3.1 Problem Statement:

This study deals with the problems which is originated due to Impure water. There are so many diseases which is spread due to consumption of impure water, so we are mainly focused on this issue so that it will helps to find out remedial measures.

3.2 Methodology :

Step 1: To visit on water treatment plant.

Step 2: To collect the required data on water treatment plant.

Step 3: To find out research paper on water treatment plant and then study this paper .

Step 4: To test on water sample on phursungi

Step 5: To design water treatment plant for phursungi

Step 6: Conclusion.

IV. ANALYSIS AND DESIGN:

As our study is mainly deals with the problems occurred due to impure water. So in Analysis part we have taken the different tests on water to determine water quality parameters and accordingly we select the design process required. The design of all treatment units is done accordingly results obtained in test. For the fixing acceptable limits of all parameters GOI manual is referred

4.1 Test Results Obtained And Termissible Linnis

Sr.No	Parameters	Result	Permissible	Unit	
Physical Parameters					
1	Turbidity	5.5	5	NTU	
2	Odour	Odourless	Nil	-	
3	Colour	16	15	Hazen	
Chemical Parameters					
4	TH(CaCo ₃)	360	600	PPM	
5	РН	7.7	6.5-8.5	PPM	
6	Ca**	104	200	PPM	
7	Mg⁺⁺	252	100	PPM	
8	Chlorides	170	200	PPM	
9	Alkalinity	440	600	PPM	
10	Iron	0.06	0.3	PPM	
11	TDS	460	500	PPM	

NTU:- Nephelo Turbidity Unit. PPM:- Parts Per Million.

4.2. Design of WTP Units:-

For design of all treatment units is done by referring the permissible value of all parameters and comparing all obtained Results with standard Results and Accordingly we have selected Treatment Units. Following table shows the Design Sizes of All treatment Unit. For the Design of all units We have referred GOI Manual and IS codes used for Drinking water supply Scheme.

Treatment Units With Design Sizes:-

Assumptions:-

- 1) Design Population = 1.5 Lakh
- 2) Design Period = 30 yrs.
- 3) Avg. Daily Consumption = 402 lpcd (Incl. All Losses).

- 4) Maximum Demand of city / Day = 0.19 M3/s.
- 5) Assume Flocculation Time = 30 Min.
- 6) Velocity of Flow in Approach Chanel = 50 cm/sec.
- 7) Detention Time For Flocculation Tank = 1 Min.
- 8) Detention Time For Sedimentation Tank = 2.5 hr.
- 9) Rate of Filtration = 3500 lit/m2//hr.
- 10) L/B ratio for filter tank = 5.
- 11) Back Washing Time = 30 Min

Sr.	Name of Unit	Design Size
No.		
1	Coagulation Tank	1.22*1.22*1
2	Approach Chanel	0.70*0.80
	C/S Area	
3	Mixing Tank	2.50*2.50*2
4	Flocculation Tank	D = 12m
		H= 3 m
5	Settling Tank	D = 20 m
		H = 4 m
		S = 1:2
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6	Weir Loading	109 M ² /m/Day
7	Gravity Filter (9 no's)	8.5*5
8	Back Washing Tank	D = 10 m
		H = 2.5 m
9	ESR	D = 15m
		H = 3 m

ESR= Elevated Storage Reservoir.

V. CONCLUSION

- From this study we conclude that selection of Treatment process is based on source of water supply.
- From this Study we come to know that for Design of WTP various parameters should be considered such as Future Population and Growth, Land Availability, Source of water supply etc.

RFERENCES

- K. Sesha Maheswaramma, K. Satyanarayana, N.Babavali, K. Etheshamul Haq, K. Renuka, "Design of Water Treatment Plant To Pulivendula", Municipal Corporation of Kadapa.
- [2] [Mrs. Gang Liu, Mrs. Ya Zhang, Mrs. Willem-Jan Knibb , Mrs. Cuijie Feng , Mrs. Wentso Liu , Mrs. Gertjan Medema , Mrs. Walter van der Meer , "Potential impacts of changing supply-water quality on drinking water distribution".