
**Wastewater Treatment Plants Planning Design And Operation
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S7, a plant is proposed to treat Water In pollution - 40mg/ L - which contains organic matter and has a high TDS (total dissolved solids). The objective is to remove TDS before the Water enters the Sewage treatment plant. What do you recommend?

PROJECT DESCRIPTION The current NPP has been operating for more than 10 years. It is designed for a daily consumption of 3200 m³. It is fed by a 20000 m³/day WTP which is cooled using a sand water / air heat exchanger. The plant is controlled by 2 on-line analog controllers (FIGS. 1a and 1b). The feed water temperature is kept constant in a range between 13± 14°C (FIG. 1a). The treated water is re-used in the WWTP.

EXISTING DOWNSIDE EFFECTS Water treatment plant uses a lot of energy because the water contains a lot of dissolved oxygen (D.O.) Water has a high D.O content (fig. 2). The incoming raw water contains a large quantity of oxygen. Respiratory enzymes enable the process inoculum to utilize this oxygen. Hence the D.O content in the treated water gets low. This results in a high organic matter loading of a secondary treatment system. Because of a high D.O content, microbial consumption of the organic matter magnifies the problem. A high carbon/nitrogen ratio is another existing side effect. The amount of released nitrogen into the treated wastewater is high. Water reuse also adds considerable amount of nitrogen into the wastewater (WTW). Also, nitrogen concentration in water increases at higher inlet temperatures (Fig. 2). High nitrogen loading is not desirable because it is harmful to aquatic life. High D.O content

in the treated water is highly undesirable because the microbes in the nitrification units would consume this oxygen. Process equipment downstream of this unit can also be negatively affected by this high O₂ content (e.g. sewage

