

Optimization of Groundwater Utilization in Fish Aquaculture

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Abstract : Groundwater is generally considered as the best source for aquaculture as it is well protected from contamination. The most common problem limiting the use of groundwater in Egypt is its high iron, manganese and ammonia content. This problem is often overcome by applying the treatment before use. Aeration in many cases is not enough to oxidize iron and manganese in complex forms with organics. Most of the treatment we use potassium permanganate as an oxidizer followed by a pressurized closed green sand filter. The aim of present study is to investigate the optimum characteristics of groundwater to give lowest iron, manganese and ammonia, maximum production and quality of fish in aquaculture in El-Max Research Station. The major design goal of the system was determined the optimum time for harvesting the treated water, pH, and Glauconite weight to use it for aquaculture process in the research site and achieve the Egyptian law (48/1982) and EPA level required for aquaculture. The water characteristics are [Fe = 0.116 mg/L, Mn = 1.36 mg/L, TN = 0.44 mg/L , TP = 0.07 mg/L , Ammonia = 0.386 mg/L] by using the glauconite filter we obtained high efficiency for removal for [(Fe, Mn and Ammonia) ,but in the Lab we obtained result for (Fe, 43-97), (Mn,92-99), and (Ammonia, 66-88)]. We summarized the results to show the optimum time, pH, Glauconite weight, and the best model for design in the region.

Keywords : aquaculture, ammonia in groundwater, groundwater, iron and manganese in water, groundwater treatment

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