

Monitoring the Phenomenon of Black Sand in Hurghada's Artificial Lakes from Sources of Groundwater and Removal Techniques

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Abstract : This experimental investigation tries to identify the root cause of the black sand issue in one of the man-made lakes in a well-known Hurghada resort. The lake is nourished by the underground wells' source, which continuously empties into the Red Sea. Chemical testing was done by looking at spots of stinky black sand beneath the sandy lake surface. The findings on samples taken from several locations (wells, lake bottom sand samples, and clean sand with exact specifications as bottom sand) indicated the existence of organic sulfur bacteria that are responsible for the phenomena of black sand. Approximately 39.139 mg/kg of sulfide in the form of hydrogen sulfide was present in the lake bottom sand, while 1.145 mg/kg, before usage, was in the bare sand. The study also involved modeling with the GPS-X program for cleaning bottom sand that uses hydro cyclones as a physical-mechanical treatment method. The modeling findings indicated a Total Organic Carbon (TOC) removal effectiveness of 0.65%. The research recommended using hydro cyclones to routinely mechanically clear the sand from lake bottoms.

Keywords : man-made lakes, organic sulfur bacteria, total organic carbon, hydro cyclone

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