

Effect of recent technological developments on SWRO incorporated in the Red–Dead project

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ABSTRACT

Since the last relatively detailed study of the large SWRO incorporated in the Red–Dead project (Harza 1996), several important technological developments were made. The most relevant are large diameter RO membranes, large and high-efficiency pressure pumps and Pelton turbines, and the isobaric energy recovery device. All have a significant effect on the sizing and economics of this large desalination project. Moreover, the new energy recovery device (ERD), aimed to reduce energy consumption, imposes a revision of the conceptual design regarding location of the pretreatment and combined production of electric power and desalination. The new concept of using an isobaric ERD or the former concept using more efficient RO membranes and more efficient pressure pumps and a Pelton-type ERD, may eventually significantly reduce investment and energy consumption; the number of RO membranes could be reduced by a factor of 4; and total energy consumption, excluding product delivery, could be reduced from about 0.9 kWh/m³ to about 0.6 kWh/m³ or less.

Keywords: Red–Dead Sea project; Large-diameter membranes; Isobaric energy recovery devices

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