Coastal versus offshore brine discharges: dispersion analysis

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ABSTRACT

Sea outfall discharges for brine disposal can be realized through either coastal or offshore means. This study analyses typical brine discharges from RO plants in the Arabian Gulf Sea through both coastal (surface discharge) and submerged offshore outfall (single and multiport diffuser discharges) using the CORMIX near-field mixing model [1].

The dispersion of mixed effluent under a range of steady state current flows covering typical current velocities in the region during ebb and flood phases and under slack tide, was simulated. The results show that the offshore multiport diffuser outfall achieves the highest mixing in both the near- and intermediate fields among all types of discharges meeting the regional water quality regulations, followed by the single port configuration where some standards are met in some conditions and the coastal discharge where mixing characteristics are the lowest and thus violating the regulations.

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