Walid Elshorbagy, Pollut Eff Cont 2016, 4:2(Suppl)
http://dx.doi.org/10.4172/2375-4397.C1.001

Walid Elshorbagy
MWH Global-Middle East, UAE

Quantifying the future impacts of potential desalination technologies in the Arabian Gulf upon the Gulf environment

Due to the arid environment and scarcity of natural renewable water resources in the Arabian Gulf (AG) area, most Gulf countries heavily rely on desalination for their domestic supplies. Such countries have major future development plans and expect to significantly extend their desalination capacities to meet the eventual growing water demands. The impact of massive future effluents from coastal desalination plants and other major coastal industries on the salinity and temperature of the AG has always been a concern and a constraint in future extension and development. A recent study utilized a 3D hydrodynamic model to evaluate the long term changes of the AG salinity and temperature (up to year 2080) considering the aforementioned effluents superimposed with climate change projections of the atmospheric ocean general circulation climate models (AOGCM) in a multi-model approach. The used model was calibrated against short-term records of water levels and currents and against long term records of evaporation, salinity, and temperature. The near-shore long term variability at the desalination intakes; representing observational points in the computational domain, was quantitatively assessed for a number of selected development scenarios. The impacts of future coastal effluents on the AG salinity and temperature were found very small and localized near the effluent points when compared to impacts of climate change. Future operational costs of desalinated water produced by four main desalination technologies (MSF, MED, RO, and Hybrid) were estimated based on the projected changes of ambient coastal conditions. The estimated costs were considered in calculating surrogate indicators referred to as Least Negatively Impacted (LNI) technology produced at major desalination plants in all Gulf countries. MED was found to be the technology of least LNI at all AG locations followed by different technologies depending on the location due to its different circulation conditions.

Biography

Walid Elshorbagy is a Professor and Technical Lead in MWH Global - Middle East with 30 years' experience in the area of Water Resources and Environmental Engineering. Before he joined MWH in June 2015 and while his tenure of 19 years in the UAE University, he conducted several studies in collaboration with the industry related to coastal hydrodynamics, EIA, water resources management, hydraulics, water quality, and wastewater treatment. His research outcomes have been documented in more than 100 publications.

Walid.elshorbagy@mwhglobal.com

Notes: