

Brine Leach Disposal in Offshore Warehouse Construction in Salt Cave

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Opinion

Brine is the main leaching product for construction of salt caverns for CO₂ offshore geological storage and many other industrial and mining processes. In recent decades, brine production in the world has increased exponentially due to the rapid increase of various processes [1]. Several studies in the last decade have been carried out to monitor the impact of brine on flora and fauna in the Mediterranean Sea near Spain. These studies indicate that the seagrass *Posidonia oceanica*, which plays an important role in marine ecosystems, was strongly affected by brine discharges and that multiport diffusion systems are currently used efficiently for better dilution of the concentrate in seawater, thus incurring in less impacts [2]. In general, available data indicate that improperly diluted concentrate discharges can locally impact benthic ecosystems, but the effects are geographically restricted to areas of higher salinity compared to ambient salinity. It is also possible to observe that small changes in salinity and temperature in the natural marine environment can have a significant impact on local ecosystems, and it is possible to have secondary, tertiary and onward impacts, depending on the peculiarities of the discharge site and other variables [3,4]. As for the technology currently available for dispersing the residual brine from the leaching process, due to their high dilution capacities, submerged multiport diffusers are considered the most practical solution to protect marine life from the harmful effects of brine and heat.

Currently, the discharge of dense brine is generally controlled by allocating large mixing zones around the point of discharge, however, these mixing zones are not always suitable for application in environmentally sensitive areas, and for such sensitive areas and for the in the case of brine containing toxic substances, stricter regulations based on a well-defined minimum return dilution at the source level are recommended [5]. New environmental regulations related to brine have emerged in various parts of the world due to increased environmental awareness, however, Brazil does not yet have specific regulations for the disposal of leaching brine in ultra-deep marine waters. Thus, the selection of an adequate brine disposal method, to satisfy existing environmental regulations, plays an important role in the viability of industries that produce this effluent. Furthermore, the accommodation of future environmental regulations is also an important issue for the planning of any undertaking, which makes knowledge of brine environmental regulations therefore useful in providing general principles and pertinent information on current trends. and future regulations, as well as understanding available brine disposal methods is also helpful in choosing suitable disposal systems based on environmental, economic and technical feasibility of proper location. At this point, it should be noted that residual brine is produced in various quantities, so understanding its characteristics and its impact on the environment is important to develop and implement appropriate environmental policies by environmental protection agencies and other bodies responsible.

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