

Integrated Waste Management In Desalination Plants In UAE

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Desalination is a process that primarily involves cleanup and purification of sea water for drinking and irrigation purpose. The process is mainly targeted and widely used in the Gulf Cooperation Council country. To concentrate on waste management, it can be stated that it includes all those operations and activities that highly ensure to minimize the waste by adopting effective waste management tools, such as recycling and effectively reusing brine waste. In the current study, it identifies a perfect understanding of integrated waste management in the desalination plant in UAE by analyzing the complete set of the research which includes the various techniques in desalination plant adopted in the UAE and also includes the improvement technique in the desalination process. The study also describes the environmental impact of seawater desalination and also examines the techniques to minimize the negative impact of the desalination plant on the environment. In accession to this, the section also describes the finding and discussion which is grounded on the existing literature which includes a summary of the literature by signifying the major concept. At last, the study also describes the summary of the reassessment that helps to make an effective recommendation for the UAE, so that they will be capable to accomplish the successful implementation of waste management effectively.

KEYWORDS

Desalination, Techniques, Environment, UAE

1. INTRODUCTION

To create a focus on the integrated waste management in the desalination plants in the Gulf countries, it can be stated that there are more than 199 desalination plants have been set up which are used in collaboration with power production plants that produce roughly 5000 million m³ of water per year. To examine the ratio, it can be said that United Arab Emirates (35%), Saudi Arabia (34%), Kuwait (14%), Qatar (8% and 5%) and Oman (4%) accounted for the seawater desalination capacity which also estimated to rise and reached up to 1800 million m³ per year by 2013 [1,2,3]. Water consumption in the United Arab Emirates (UAE), owing to its geographical whereabouts, falls below the top 10 most water-scarce countries of the world. This is easily understandable when a certain light is brought on its climate, extremely hyper-arid in nature. Average annual rainfall is generally less than 100mm. However, when statistics take into consideration, the UAE also becomes the country with one of the highest per capita water consumption rates in the world which is 550 liters per day which are easily double of the national average at the global level.

Desalination is making more and more efforts and is constantly committed to adopting innovative techniques to reduce the output content of the rejected brine. However, they face immense problems such as the sprouting of desalination plants at a steady pace, the improvement of many regulatory processes associated with the removal of rejected brines, etc. Associated with the effective adoption of the waste management and disposal of the released brine. Restrictions also lead to limited access to non-temporary disposal options. This has highly affected the modern practices that are carried out by the desalination plants to reduce the harmful brine concentrate to low levels in a negative manner [4]. As a result, the UAE's governing bodies are working to reduce restrictions that hamper the effective advancement of innovative desalination practices.

To examine the environmental impact of the use of distillation plants by the Gulf States, it can be said that it leads to the loss of aquatic organisms. It was also examined that due to the distillation process, the large quantities of brine water released back to the sea, may increase the temperature and cleaning chemical products and heavy metal which was discharged along with the brine into the sea, that highly affects the Aquatic life and Marine environment [5,6,7]. The