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# **Feasibility Of Using Desalination Technologies to Supplement Water Supplies In Eastern Virginia**

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## **Abstract:**

The increasing demand for fresh water caused by population growth and rapid economic development has made the utilization of non-conventional water resources to supplement water supplies more attractive. Desalination is the process of removing salt from water. The amount of salts in the water can be described in terms of total dissolved solids (TDS). The range of TDS concentrations in natural water range anywhere between 500 mg/l to 50,000 mg/l, with brackish water having TDS concentrations in the lower range and seawater having concentrations on the upper end of the range. Desalination technologies, though still evolving, are well established. Using desalination technologies to obtain fresh water from brackish water or seawater show a promising future in addressing water shortage problems in diverse geographic areas in the United States and around the world.

This paper investigated the feasibility of using desalination technologies in eastern Virginia to supplement future water demand. Based on future population trends and availability (and quality) of surface and groundwater resources to meet future demands, geographic areas along the coastal Virginia were identified as the possible locations for future desalination plants. Potential water sources in the area for desalination are brackish groundwater, tidal river water, Chesapeake Bay water, and seawater. Major factors that affect the O & M cost of producing fresh water include TDS concentration in the feed water, water plant capacity, type of desalination technology, labor and energy costs. We used the software package “Desalination Economic Evaluation Programme (DEEP)” developed by the international Atomic energy agency (IAEA) to conduct the economic analysis. The cost estimation was based on using the reverse osmosis (RO) process, the most common technology used in the United States. The presentation will include justification for developing scenarios for using desalination technologies to supplement water supplies in eastern Virginia, results for site-specific economic analysis, and a discussion of the environmental and regulatory issues that may impact the feasibility of implementing desalination technologies.

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