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Conclusions

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Advanced technologies are available in the U.S. and worldwide for desalination of brackish water and seawater to supplement freshwater supplies. Existing desalination of brackish water indicates that this can be implemented with costs that are acceptable to some consumers. At present, desalination of seawater is more costly as compared to treatment of conventional raw water and brackish water. However, ongoing research on membrane technologies and energy conservation will further reduce the cost of water to customers. Large-scale desalination of seawater is economically feasible and future technologies will ensure the cost-effectiveness of small-scale desalination plants.

While economic feasibility of using desalination technologies shows potential for future expansion of desalination plants, several other issues remain to be addressed. Desalination cannot be considered as a stand-alone measure to meet increased water demand for public water supplies. Desalination should be considered as a viable component of an overall water supply management that includes consideration of a region's total water budget in terms of sources of water (fresh and impure) and all uses of water (public water supplies, agricultural, industrial, etc.). To meet future water demand, there is a significant need for developing a complete inventory of available surface and groundwater resources and water uses.

Less is known about environmental consequences of desalination. Research is needed to evaluate the ecological effects of desalination, such as the effects of water withdrawal and intake structures, the effects of concentrate disposal, and the economic feasibility of various concentrate management options. At present, regulatory requirements for implementing desalination technologies are rather fragmentary and piggy-back on existing regulations. Normally, multiple permits from federal, state and local governments are required. There is a need to further streamline these regulations in order to facilitate environmentally sound, cost-effective and fast implementation of desalination technologies.

This publication is based on existing literature and experiences and is by no means complete. Like many other fields of water resources, the science of desalination is a dynamic area that is developing very rapidly. It is expected that this publication will facilitate curiosity, encourage research, and the inclusion of desalination concepts in educational curricula.

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