

**NAME:**

Kay Bailey Hutchison Desalination Plant

**LOCATION:**

El Paso, Texas

**PLANT SIZE:**

27.5-mgd capacity

**INFRASTRUCTURE:**

Prefiltration and RO membranes treat brackish water at the plant, which also includes well fields, a technology and education center and injection wells.



Interior photo of the membrane skids at the Kay Bailey Hutchison Desalination Plant.



El Paso and Ft. Bliss, two cities in an area that gets 9 in. of rainfall annually, have formed a partnership that will ensure sufficient water supplies for years to come.

**LEARN MORE**

For additional articles on this topic, visit:  
[www.wwdmag.com/lm.cfm/wd040804](http://www.wwdmag.com/lm.cfm/wd040804)

**PLANTPROFILE**

By Neda Simeonova

# A Forward-Looking Approach

*El Paso Water Utilities explores aggressive reclaimed water programs*

The world is increasingly challenged by decreasing supplies of fresh water, and for drought-stricken cities like El Paso, Texas, technology advancements in water reclamation are making a significant difference.

The city of El Paso's water sources include groundwater from aquifers and surface water from the Rio Grande. Unfortunately, these sources are limited in years of drought. Furthermore, the Hueco Bolson, from which El Paso draws fresh water, is also the source of water for Ciudad Juárez in México and other communities in the area. As a result, water levels in the aquifer have declined dramatically.

**Diversifying Water Resources**

Realizing the need to diversify its resources and to reduce reliance on water from the Hueco Bolson, El Paso Water Utilities (EPWU) has taken significant conservation initiatives. The EPWU has also explored aggressive reclaimed water programs projecting 15% of the annual potable water will come from reclaimed water by 2012. In the early 1990s, however, EPWU began exploring the idea of desalinating the brackish water in the aquifers.

In 1997, the EPWU and the Juárez water utility, the Junta Municipal de Agua y Saneamiento, along with other agencies in the U.S. and Mexico, commissioned the U.S. Geological Survey to conduct an analysis of the amount of fresh water remaining in the Hueco Bolson, the amount of brackish water available, and to determine the flow patterns.

The analysis revealed that the amount of brackish water in the Hueco Bolson exceeds the amount of potable water by about 600%.

As a result, five years later, the EPWU drilled and monitored nine test wells to characterize a section of the aquifer selected to provide the blend water. An extensive analysis of the wells was performed and a reverse osmosis (RO) pilot plant was constructed.

**El Paso Today**

Just two years later, on Aug. 8, 2007, U.S. Senator Kay Bailey Hutchison (R-Texas) and U.S. Environmental Protection Agency (EPA) Administrator Stephen Johnson attended a ribbon cutting ceremony for the new Kay Bailey Hutchison Desalination Plant.

"It is the largest inland desalination plant in the U.S.," said Fernando Rico Jr., P.E., El Paso Water Utilities water systems division manager.

According to the EPWU, "this plant represents a forward-looking strategy in water supply—not only for a region but also for a world that is increasingly challenged by short supplies of fresh water."

When the EPWU started planning the plant construction, Ft. Bliss was considering a similar facility. The two cities recognized the benefits of a partnership in a costly and complex project and formed a public-public partnership. Today, this is the largest public-public project of its kind in the U.S.

The Kay Bailey Hutchison Desalination Plant produces 27.5 million gal per day (mgd) by blending 15 mgd of permeate from a RO plant with raw "blend" water, resulting in a fresh water production increase by approximately 25%.

The new \$95-million facility includes the desalination plant, the well fields, a technology and education center and injection wells to dispose of the salty concentrate left behind, according to the EPWU.

The plant operating cost is estimated to be

approximately \$4.8 million per year.

**The Process**

To ensure success of the project, considerable study and research were needed to assure the validity of the design and better understand the environmental effects.

Biwater AEW, Inc., a supplier of municipal membrane treatment plants in the U.S., supplied the El Paso water membrane plant. After drawing the brackish water from the Hueco Bolson, the raw water is pumped to the plant and filtered before being sent to the RO membranes. Approximately 83% of the water is recovered while the remainder is output as a concentrate. The permeate is piped into a storage tank and the concentrate is routed to a disposal facility. The permeate is then blended with water from new wells and the finished water is sent to the distribution system.

**Inland Desalination Challenges**

With the decrease in cost of membrane technology, many coastal cities turned to the ocean to supplement their water supplies. Coastal cities, however, have access to a consistent water supply and can return the concentrate to the ocean.

According to the EPWU, an inland desalination plant can present a number of challenges:

- Test wells were needed to find a stable and consistent supply of brackish water.
- Hydrogeological studies were needed to determine the flow of the brackish water in the Hueco Bolson.
- Testing, studies and pilot projects were performed to determine the most economically and environmentally sound means of disposing of the concentrate.

Furthermore, "Timely completion in order to prevent a drought and staying within budget with minimal change orders was challenging," Rico added.

**Added Benefits**

In addition to being able to use Hueco Bolson's previously unusable brackish water to provide fresh water, the Kay Bailey Hutchison Desalination Plant offers other important benefits.

According to the EPWU, the plant serves as a model and center of learning for other inland cities facing diminishing supplies of fresh water. Additionally, the water pumped to the plant protects El Paso's and Ft. Bliss' fresh groundwater supplies from brackish water intrusion by capturing the flow of brackish water toward freshwater wells.

In addition to removing salts, the desalination process also removes other potential pollutants from the water, providing quality drinking water to the area residents.

And finally, in an area that typically receives 9 in. of rain annually, the potable water produced by the desalination plant ensures El Paso and Ft. Bliss have sufficient water to support growth and development for more than 50 years. **wwd**

Neda Simeonova is editorial director of *Water & Wastes Digest*. Simeonova can be reached at 847.391.1011 or by e-mail at [nsimeonova@sgcmail.com](mailto:nsimeonova@sgcmail.com).

For more information, write in 1111 on this issue's Reader Service Card.