

## PolyCera® Hydro UF membranes prove to be an essential part of power plant blow-down water recycling process

### Overview:

- Power plants consume significant amounts of raw water and generate waste water. This waste water, a wasted resource, is often disposed of by injecting into disposal wells or into retention ponds.
- Cooling tower blowdown water has a very challenging chemistry with high levels of sparingly soluble minerals, especially silica, which can limit water recovery during treatment.
- The **PolyCera Hydro** UF membranes, in conjunction with other process and control improvements, were able to treat this challenging waste water and prove significantly lower CAPEX and OPEX costs, therefore making reuse a compelling economic solution.



Power Plant  
Blowdown



California, USA



Process Water  
Reuse



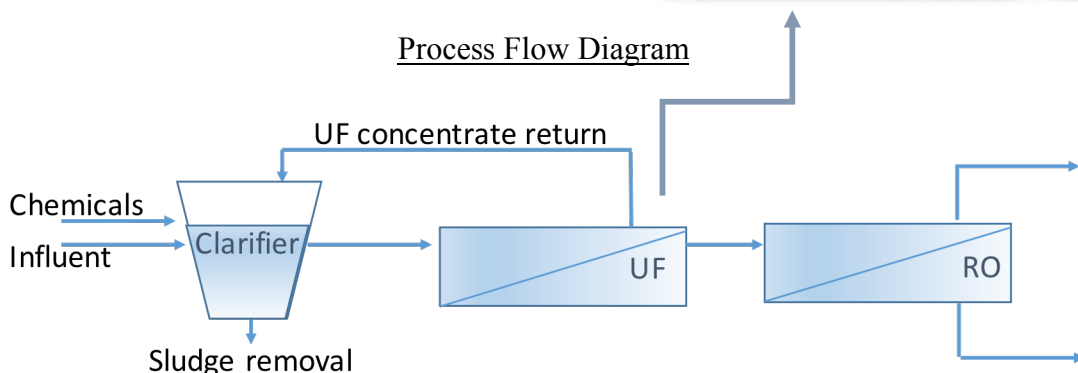
\$3B Market

### Demonstration:

- **PolyCera Hydro** membranes were selected as part of a novel and low-cost treatment train to perform removal of silica, solids, and other contaminants from the challenging cooling tower blowdown.
- **PolyCera Hydro** (100 kDa) Spiral Monoliths® membrane elements with open channel spacer design, accommodates high levels of solids without spacer clogging, was selected. The membrane is back-washable and can operate in crossflow mode. The PolyCera Hydro elements treated the effluent from the chemical desilication clarifier as a pretreatment to the RO.



### Process Flow Diagram



*PolyCera Hydro*

**Results:**

- The **PolyCera Hydro** membrane consistently produced a high quality of filtrate with average turbidity, aluminum, and silica removal efficiencies of 96.4%, 73.4%, and 82%, respectively.
- **PolyCera Hydro** produced a silt density index (SDI) of below 3, which is the threshold level prescribed by reverse osmosis membrane manufactures for good quality feed water.
- System specific energy consumption (SEC) was stable reflecting the operational consistency observed throughout the pilot. The average SEC was calculated at 0.080 kWh/m<sup>3</sup>
- Clean in place (CIP) events, 2 within the 6 weeks of demonstration, showed significant improvements in flux recovery.

>90%

Water Recovery

<0.1 NTU

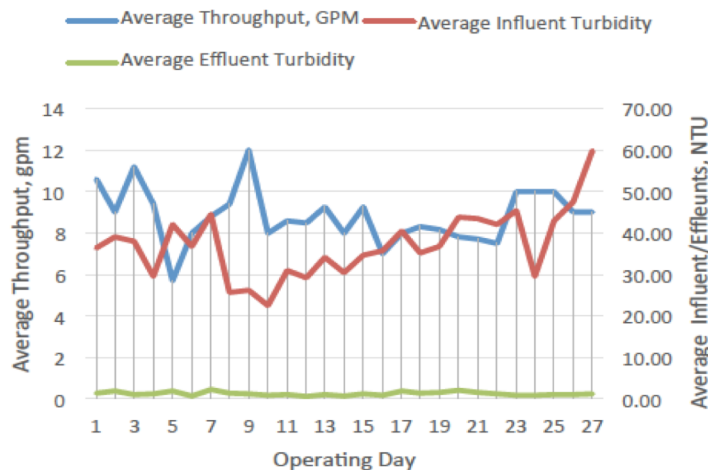
Filtrate  
Turbidity

<3.0

Filtrate SDI

~25 gfd

Average Flux



**Figure 1:** UF performance over the entirety of the demonstration study.

**Value Proposition:**

- **PolyCera Hydro** membranes are made from a polymer material that has superior threshold for withstanding highly fouling prone waters, exhibiting high cleanability and flux recovery after fouling.
- **PolyCera Hydro** provided an absolute total suspended solids (TSS) barrier ahead of the RO system, as the membrane pore size provided complete removal of any solid particles greater than 0.01 microns.
- The **PolyCera Hydro** element construction with open channel spacer allowed for very high levels of solids in the feed water.

<0.5 ppm

Filtrate TSS

*Check other available case studies for PolyCera Hydro membrane performing in biological and industrial wastewater treatment applications.  
Learn about other PolyCera membranes, properties, and configurations.*