

Cottonwood Power – Ultrafiltration Pretreatment of a Problem Water

The Facility

The Cottonwood Power Project is one of the first United States power plant projects for InterGen, a joint venture between Houston-based firms Shell Oil Co. and Bechtel Corp.

Located in Deweyville, Texas along the Texas-Louisiana border, the plant is a natural gas fired, four-unit combined cycle facility capable of producing 1,230 megawatts of power.

The Problem

The feed water for the power station's needs is river water from the Sabin River which contains high levels of colloidal silica and TOC.

The Solution

Aquatech determined that the river water would first need treated in an Actiflow Clarifier. Two MMF Units of 425 GPM (95 m³/hr) each were then provided to remove the suspended solids while an Ultrafiltration Unit of 225 GPM (51 m³/hr) net capacity with 92% recovery was used to remove colloidal silica. Finally a Demineralization train (SAC/SBA/MB) was provided to remove all minerals so that the plant would have the boiler make-up quality water of Conductivity: 0.1 microsiemens/cm, Silica 0.01 ppm and Sodium 0.01 ppm. This Demin train has a net capacity of 210 GPM (47.5 m³/hr) and is complete with all the auxiliaries including cleaning skid for U/F and regeneration skids, neutralization system and all other pumps.



Design Water Analysis

Calcium	33.03 ppm
Magnesium	17.0 ppm
Sodium	109.0 ppm
Total Cations	167.8 ppm
Bicarbonates:	53.0 ppm
Sulfates:	58.3 ppm
Chloride:	52.5 ppm
Total Anions	167.8 ppm
CO ₂	12.0 ppm
Silica (SiO ₂)	28 ppm
Other Contaminants	
TOC	2.0-9.0 ppm
Colloidal Silica	1.4 ppm