

Revolutionary HERO™ Membrane Process offers Economical ZLD Solution for an Arizona Power Plant

The Facility

Griffith Energy LLC are developers of Griffith Energy Project a new 520 MW natural gas fired combined cycle facility located 8 miles south of Kingman, Mohave County, Arizona.

Black Veatch Corporation of Kansas City who were engineers for the project recognized HERO as the suitable economical process to deal with the cooling tower blow down reducing the waste by 90% and thus substituting a thermal brine concentrator at less than half the cost and enormous power saving.

The Problem

The cooling tower blow down volume was about 230 gpm saturated with silica, high hardness and other constituents. A conventional membrane process can not function under these conditions due to silica and other organic limitation. A thermal brine concentrator will be cost prohibitive. The permitting of the power plant was based



on evaporation pond. Customer was looking for an economical solution to preconcentrate the blow down and thus have a smaller size evaporation pond.

The Solution

HERO™ is a Patented process which addresses the treatment of high silica, organic and bio active feed water and hence treatment of cooling tower blow down enabling recovery and reuse of the blow down water. HERO™ is a membrane process with modified pre treatment scheme to accommodate high silica concentrations. HERO™ has been successfully tested with silica level of 2000 PPM in the reject. Wastewater recovery with HERO™ process is limited only by osmotic pressure. The process is resistant to organic and biological fouling. System recovery of 90% + is achievable thus a good substitute for thermal brine concentrator.



Aquatech International Corporation

One Four Coins Drive; Canonsburg, PA 15317 USA

T: 724-746-5300

F: 724-746-5359

aic@aquatech.com

www.aquatech.com



PROJECT PROFILE SERIES # 001

Cooling Tower Blowdown Chemistry

DESIGN WATER ANALYSIS

Calcium (Ca ⁺⁺) as CaCO ₃	840	Alkalinity as CaCO ₃	150
Magnesium (Mg ⁺⁺) as CaCO ₃	120	Sulfate (SO ₄ ²⁻) as CaCO ₃	360
Sodium (Na ⁺) as CaCO ₃	1536	Chloride (Cl ⁻) as CaCO ₃	2034* Adjusted
Potassium (K ⁺) as CaCO ₃	84	Total Anions as CaCO₃	2580
Other cations as CaCO ₃			
Total Cations as CaCO₃	2580		
Carbon Dioxide as CO ₂	4.5	Temperature, °F	100
Silica as SiO ₂	140	Other contaminants:	Suspended solids
pH	7.8		

The plant is 3 x 50% capacity unit thus providing redundancy.

