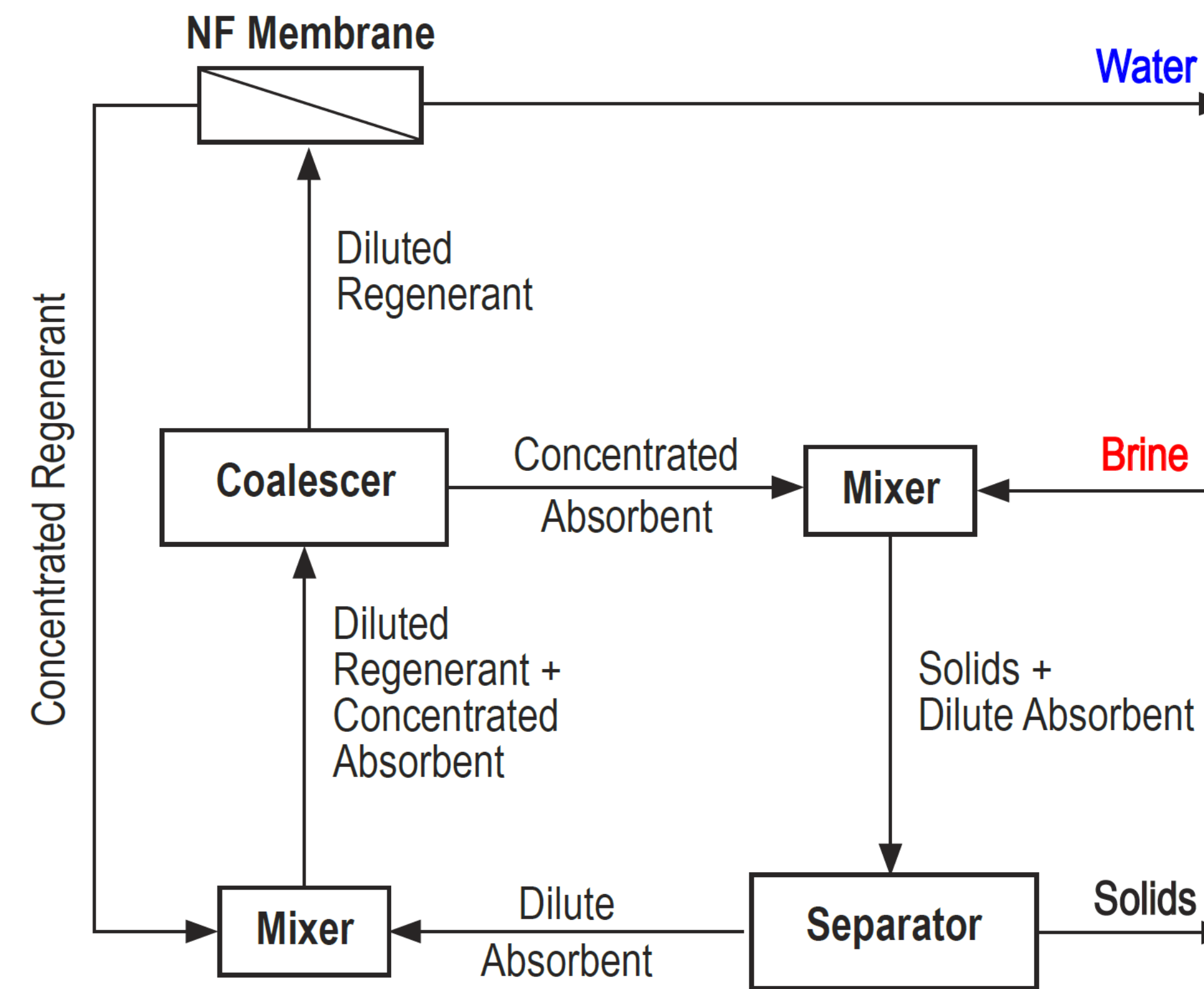


## Details of the demonstration

Name of client	:Petro H2O Recovery
Sample Source	:Delaware Basin Powder River Basin
Application Type	:Oil & Gas Basin Produced Water
Influent spec	:Delaware - TDS 215,000 ppm Powder River - TDS 55,400 ppm
Effluent spec	:Salt Solids

Produced water brine samples supplied by PHR Rodi, sourced from the Delaware Basin in West Texas and the Powder River Basin in Wyoming, comprised mainly of chloride salts, predominately Sodium and Calcium. The Powder River sample also contained a high level of Boron at 25ppm.



*Aquafortus' ABX™ non-thermal ZLD process*

## What problem did this aim to solve?

Produced water brines from Oil & Gas fields are increasing in both volume and salinity, while disposal options are concurrently dwindling in number and increasing in cost. The disposal of high salinity produced waters is a significant cost component of onshore oil & gas production

The primary objective of applying the Aquafortus ABX™ technology in this application is to achieve the reduction of high salinity brine volumes in both a cost and energy efficient manner. The reduction of absolute brine volumes significantly impacts the economics of downstream transport and disposal operations.

## What was the compelling value proposition?

The reduction of brine volumes in the Oil & Gas produced water market is critical to the sustainable management and disposal of ever increasing volumes of high salinity brines being produced by Oil & Gas fields. These brines are typically not amenable to membrane based processes due to high TDS levels and precipitation issues. The use of energy hungry and capital intensive thermal evaporation technologies is typically required.

The Aquafortus' ABX™ wholly replaces the power hungry thermal evaporator and crystallizer, using 80-90% less energy and lowering overall treatment costs by more than 60%. The Aquafortus' ABX™ system can precipitate out all salts commonly found in industrial waste waters and is a continuous and regenerable process.

## The Experience

Powder River	: > 99 % Salt Recovery
55,400 ppm	99.96 % Salt Rejection
	> 90 % Volume Reduction
Delaware	: > 99 % Salt Recovery
215,000 ppm	99.97 % Salt Rejection
	> 80 % Volume Reduction

Both brines were able to be reduced to a thick slurry quickly and efficiently using the Aquafortus ABX™ technology. However, the specific composition and high solids content of the Delaware brine sample produced a thick and hard to move slurry that quickly fouled constrictions in the process. Improvements that will be made to the process to handle these solids include the use of an open throat centripetal filter for solids shortly after precipitation.

## What this means for the future?

The Aquafortus' ABX™ system can precipitate out all salts commonly found in industrial waste waters. This means it can be applied in a wide range of applications where minimal, near-zero or full zero liquid discharge is desired.

As the core of the Aquafortus' ABX™ non-thermal Zero Liquid Discharge process is relatively simple, it can be applied to a wide range of applications with minimal adaptation.

With a rapidly expanding market being driven by both operational efficiency and tighter regulations, the high performance and low running cost of the Aquafortus' ABX™ technology means the company is well placed to gain a significant market share in the high-recovery market.