

# WATER DESALINATION REPORT

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## Chemical EOR to use vessel-based SWRO

Houston-based Water Standard has won its second oilfield desalination project in as many months. According to CEO Amanda Brock, the company will team with MMC Oil & Gas Engineering to undertake the engineering of a full-scale, vessel-based SWRO plant with a capacity to desalinate or soften 150,000 bbl/d (23,845 m<sup>3</sup>/d) of seawater.

The system to be designed will be used in a chemically enhanced oil recovery (CEOR) project for Petronas' Angsi oil and gas complex offshore Malaysia, to achieve an incremental oil recovery of up to 20 percent. Most people imagine an oil reservoir as being a big underground void filled with oil; nothing could be further from reality.

Most reservoirs consist of tight rock formations that resemble concrete. In CEOR projects, the water/chemical solution – a mixture of desalted or softened seawater with alkali, surfactants and/or polymer (ASP) additives – must be pumped through the formation at pressures of up to 10,000 psi (690 bar) to produce residual oil.

According to Water Standard's chief technology officer Lisa Henthorne, water chemistry is the key to a successful CEOR project. "Unlike a typical seawater desal plant where the goal is to provide potable water or to meet a maximum TDS and boron limit, these projects require a very exacting and customized water chemistry based on the specific reservoir geology, ASP cocktail and formation clay composition.

The injection water must be compatible with the formation and work in tandem with the ASP chemicals to enhance oil removal, while pushing the oil through the formation without precipitation," she said. "It's tricky business."

A pilot project has already been conducted and a tender is expected to be floated before the end of the year for a turnkey contract on the vessel conversion. The Angsi project is believed to be the first vessel-based chemical EOR project in the world. Petronas has set a target of starting up the Angsi chemical EOR project by 2013.

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