

PRODUCTION OF HIGH QUALITY WATER FOR OIL SANDS APPLICATION

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Canadian oil sands in the province of Alberta are a hydrocarbon source for North America. By the year 2015, the oil sands will be producing in excess of 3 million barrels/day of crude oil. A number of companies operate Upgraders that convert the bitumen that is extracted from the oil sands into light sweet crude oil. Steam is required to heat utilities at the Upgrader facility.

In one major oil sands extraction site, well water is being used as feed water for the boilers producing this steam. Reverse Osmosis (RO) systems were designed and installed to produce high quality water required for this application. The pretreatment system was designed with conventional multimedia technology. The RO system required feed water with silt density index (SDI) of 3 or less. Due to ineffectiveness of the conventional pretreatment system, the SDI of the RO feed water was in the range of 12-20. This resulted in severe fouling of the RO membranes and production losses.

In order to optimize the performance of the RO membrane system, a pressurized microfiltration membrane system was delivered and commissioned within 5 days to replace the existing pre-treatment system. The new unit contained an automated PVDF hollow fiber microfiltration membrane system mounted in a trailer. SDI values in the range of 1.0-2.5 were immediately observed in the feed water to the RO system. The end user has enjoyed significant cost savings and ease of operation as a result of this innovative technology. This paper describes the details of the installation and the superior performance data gathered at the end user site.