HISTORY
An operator in Southwest Saskatchewan was performing horizontal multi-stage fracturing completions on a multiple well pads, utilizing cemented liners and sliding sleeve completion technique in the Shaunavon formation (±40°C BHT). Traditional methods of formation breakdown required the use of 0.5-1.0 m³ of 15% HCl Acid to be pumped down hole prior to each fracturing stage.

PROPOSAL
Samples of the produced water were tested for compatibility, as this was proposed to be used as the concentrated HCR diluent. Fresh water and formation oil were also submitted for compatibility testing, to ensure Enviro-Syn HCR-2000 Acid was compatible with all work-over fluids. Refer to attached report.

OPERATIONS
Concentrated Enviro-Syn HCR-2000 Acid is pre-mixed with the produced water to a dilution of ±33% HCR Acid for each treatment. 0.5 m³ of the 33% HCR Acid was pumped for each spearhead stage, all other operational components and procedures remained the same as traditional methods using 15% HCl Acid.

RESULTS
A trial total of 66 intervals were treated on 3 wells, with 100% breakdown success on every stage. Breakdown pressure differentials in the range of 5-10 MPa were observed, which was comparable to 15% HCl Acid. The customer was pleased with the results and converted all operations in the area to Enviro-Syn HCR-2000.

Over 5000 intervals have since been completed to date.

VALUE
The greatest value driven effort was seen in the reduction of total loads of acid, and diluting with location fluids (high salinity production water). Operational efficiencies saw the elimination of having to circulate tanks of 15% HCl Acid, reduced potential corrosion to downhole tubulars and reduced HCl Acid exposure to personnel by having a non-hazardous, non-fuming acid on location.

The operator will continue with the use of the Enviro-Syn® HCR 2000 Acid in this application, as well as other completion/production treatments on future wells.