

## TriVert™ Diverting Agent – Targeting Untreated Intervals in New Completions

### Business Needs

A customer operating in the Marcellus Shale required a degradable diverting agent that performed at 135°F (57°C). The customer expressed concern that other products on the market are limited to temperatures greater than 150°F (67°C), and require the use of a high pH solution to accelerate dissolution at lower temperatures. Marcellus completion jobs require the use of recycled and produced waters that can have total dissolved solids as high as 250,000 ppm with hardness of approximately 90,000 ppm. The customer feared high pH solutions used as an accelerator would precipitate scales near the wellbore, hindering production.

### Trican Solution

Trican addressed our customer's initial concerns using TriVert™ 1000, which can be used at temperatures as low as 115°F (46°C). Trican's TriVert products are temporary bridging agents designed to redirect fluids from dominant perforations or fractures into different sections along the wellbore. Using a range of particle sizes, TriVert enables larger particles to bridge off at the fracture opening, allowing smaller particles to occupy the remaining voids, filling in the perforation tunnel back to the casing. To accomplish complete dissolution, the system uses unique chemistry that eliminates the need for remedial treatment for the diverting agent.

The system is kept within a specific pH range, which eliminates the possibility of the ions precipitating out of solution and prevents scale formation. TriVert 1000 completely dissolves, requiring no further intervention to clear isolated perforations.

### Results

TriVert allowed the customer to treat the well as desired using degradable diverting agents. TriVert targeted and isolated dominant perforations, redirecting the treatment into under-stimulated sections of the wellbore. The well was completed in 24 stages, pumping two-thirds of the treatment ahead of the TriVert pill. The remaining third of the treatment was redirected into a different section of the wellbore. The customer is now incorporating TriVert into every new completion design it pumps in the Marcellus Shale.

---

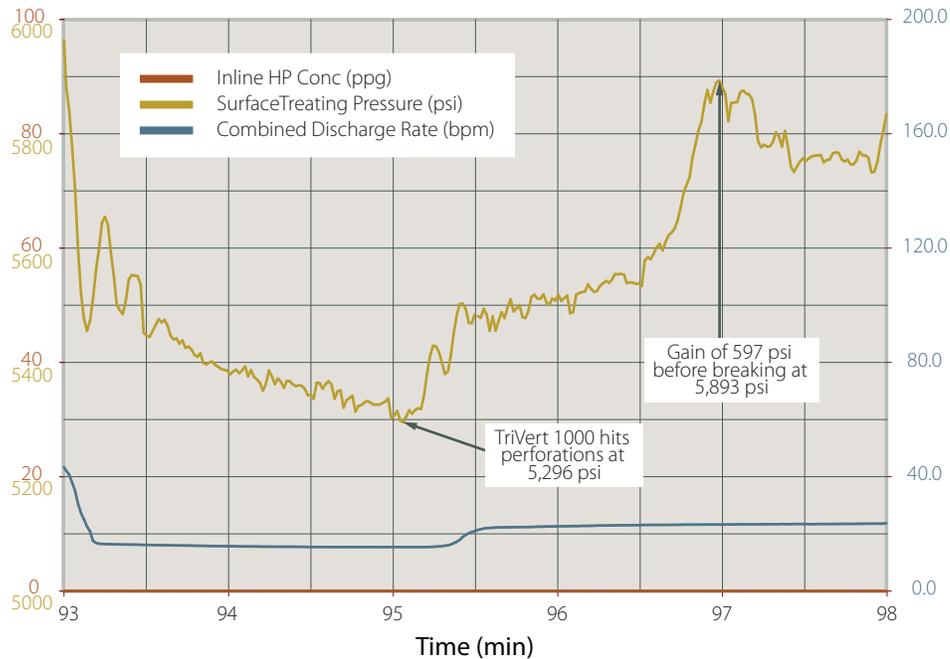
Trican met our customer's requirements by using TriVert™ 1000, which can be used at temperatures as low as 115°F (46°C).

The pressure responses showed that diversion was accomplished during the treatment (Figure 1):

- The average pressure response was approximately 300 psi (2.07 MPa)
- The highest pressure response was approximately 600 psi (4.14 MPa)

### TriVert 1000 Marcellus Formation

Figure 1: Maximum Pressure Response



## Case Study Snapshot

**Date:** 07/2015

**Location:** Marcellus Shale

**Product:** TriVert™

### Challenge:

- Target all perforation clusters using a degradable diverting agent below 150°F (46°C).

### Trican Solution:

- Use Trican's TriVert 1000 diverting agent, a temporary bridging agent designed to redirect fluids from dominant perforations or fractures into different sections along the wellbore, with a catalyst.

### Results:

- Allowed the operator to complete the well as desired.
- The operator decided to incorporate TriVert into every new completion design in the Marcellus Shale.



**Corporate Head Office**  
Suite 2900, 645-7th Ave SW  
Calgary, AB, Canada T2P 4G8  
**P** +1.403.266.0202  
**W** TricanWellService.com

**Houston Office**  
5825 N. Sam Houston Parkway West  
Suite 600, Houston, TX, U.S. 77086  
**P** +1.281.716.9152  
**W** TricanWellService.com