

## CASE STUDY

### EFFECTIVE SCALE CONTROL SOLUTION FOR AN ESP WELL AND PIPELINE

**CLIENT:** Major Oil and Gas Producer  
**LOCATION:** Swan Hills, Alberta, Canada  
**APPLICATION:** Emulsion Pipeline

#### BEFORE CLEARWELL

Major deposits of calcium carbonate scale were forming in a 500m section of a sub-surface emulsion pipeline in Swan Hills, in Alberta. The pipeline is fed by a producing ESP well and transports the produced fluids to a processing facility for separation.

The operator had been regularly deploying cleaning pigs along this section of the pipeline but, after damage occurred to one of the pigs, a chemical cleanout was undertaken. Normal operations then resumed, however, after only four months, the scale had built up again and was affecting the normal flow in the pipeline.

The operator decided to test the ClearWELL™ technology on the well that was producing into the pipeline. To ensure a clean system at the beginning of the test, an acid stimulation was undertaken to remove the scale, immediately followed by the installation of a ClearWELL™ unit. The cost of chemical scale removal, over the four months preceding installation, was around CDN \$20,000 and lost production from downtime to perform the interventions amounted to approximately CDN \$7,000.

#### AFTER CLEARWELL

Following the installation of ClearWELL™ technology, until the time of reporting (four years), both the well and connected section of emulsion pipeline have been effectively and continuously protected from scale build-up.

There has been no requirement to perform further chemical cleanouts, which has reduced the cost of ownership of the pipeline system and maintained production rates. By installing ClearWELL™ at the wellhead, the technology has successfully treated the build-up of scale in the pipeline.



**Before ClearWELL™**  
(Photographs courtesy of client.)



**After ClearWELL™**

Following successful scale control at this site, the operator has proceeded to install ClearWELL™ technology at other wells, with no subsequent incidents of scaling at any of these sites. The cost savings and production efficiency achieved using this technology are considerable, particularly when multiplied across several site installations.

The ClearWELL team provides ongoing technical support to the client with regular updates on unit health and performance.

#### QUICK FACTS

- Subsurface pipeline was subject to major  $\text{CaCO}_3$  scaling.
- Four months after costly chemical clean-out operations, scale would have reformed.
- Installing ClearWELL™ at the ESP well treated the source of the scale to prevent adhesion.
- No scale build-up has occurred since ClearWELL™ was installed.
- Scale intervention, downtime and chemical costs were eliminated.
- Production and pipeline flow were assured, resulting in significant operational savings.

#### THE PROCESS

- The ClearWELL™ unit is connected to production equipment at the surface wellhead – no intervention required, no loss of production.
- The unit transmits a pulsed radio frequency signal down into the wellbore or along flowlines and equipment. The pulsed signal delivers energy to the scaling ions, controlling precipitation, keeping the liquid below saturation and minimising scale growth on production equipment.
- ClearWELL use satellite monitoring to ensure optimum unit performance. Where required, personnel perform regular non-intrusive equipment checks.
- ClearWELL™ systems are low power consumption and certified Class 1, Zone 1. The AC signal system is corrosion neutral.