

CASE STUDY

CLEARWELL™ TECHNOLOGY CONTROLS HALITE SCALE IN US GAS WELL AND DELIVERS 30% PRODUCTION UPLIFT.

LOCATION: USA

APPLICATION: Gas Well



BEFORE CLEARWELL™

A high temperature gas well in Louisiana, USA, was suffering from severe salting, with halite scale forming on the tubing and production casing. The continual salt buildup reduced the velocity of gas flow, which caused an accumulation of produced water and condensate in the well. This fluid needed to be unloaded as often as twice a week to maintain production levels. To remove the halite the operator had been undertaking freshwater flushes every six months, which had reduced the unloading but resulted in around two weeks of non-productive downtime.

Since the operator already had ClearWELL™ technology installed on 28 other wells to successfully inhibit calcite and barite scaling, it was keen to explore the technology's ability to control halite. If ClearWELL™ could reduce or eliminate water flushes and the frequency of fluid unloading, and if it could maintain consistent production levels, then it would provide significant value.

AFTER CLEARWELL™

Our team conducted a standard range of well assessments using inhouse simulations and site visits to assess the suitability of the ClearWELL™ technology for this well. Once all criteria were satisfied, a small signalling unit was connected to the surface of the well to control the persistent and progressive downhole buildup of halite. The unit's performance continues to be remotely monitored by ClearWELL's control centre, with regular health check site visits undertaken by our engineers to ensure the equipment remains in good order.

Initial feedback from the operator four months after our electromagnetic technology was installed was very positive, citing a noticeable improvement in line pressure. Freshwater flushes had been eliminated and the requirement to unload fluids was reduced from around the usual sixteen over four months to just two.



KEY FACTS

- ClearWELL's continuous scale control delivered a 30% increase in annual gas flow rate.
- Elimination of biannual freshwater flushing and the associated four weeks of downtime and lost production each year.
- With successful first-hand evidence of value and efficacy, this operator plans to install ClearWELL™ on every new well that it brings online.
- Eliminating freshwater flushing to combat halite results in increased revenue, OPEX cost savings and a lower carbon footprint from operations, transportation and processing.
- ClearWELL is an eco-friendly electrical solution.

Performance continued to improve over the coming months. Chloride sampling of produced fluids the day before ClearWELL™ was installed, returned a reading of 5,900 ppm and 12 months later the reading was 77,000 ppm. The increase in chloride suspension was evidence that the halite (sodium chloride) forming ions were being maintained within the produced fluid and their adhesion to downhole equipment was inhibited.

In addition, gas flow velocity had stabilised, no further fluid unloads had been required, water flushes and the associated non-productive downtime had been eliminated and the well had delivered a 30% average annual increase in production.

The client has followed up by installing further units on additional wells susceptible to halite issues and now plans to install ClearWELL™ technology on every new well that it brings online.



A spokesperson for the operator said:

"Before we installed ClearWELL™ technology, the well was having very random and heavy unloads. In 2019 and 2020 I was unloading the well sometimes up to twice a week.

Since we started freshwater treatment, the unloads subsided but the treatment required four weeks downtime in total every year, plus additional cost. Since installing ClearWELL™, production has rebounded, tightened up and the line pressure is on a good trend."



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 supplied as a certified Class 1, Zone 1. The AC signal system is corrosion neutral, no reported gauge signal interference.