A New Technology Prospect in CO_2 Surveillance

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Abstract

This presentation will discuss a new surveillance technology that allows CO_2 EOR flood operators to see where injected CO_2 is going and helps them decide on real-time corrective actions to improve sweep and maximize production from every pattern. This technology has been developed by Seismos, an Austin-based technology start-up, and was introduced into the market last year.

CO_2 has been used for Enhanced Oil Recovery for decades, and the only viable way to track where CO_2 gas is going after injection has been with 3D/4D seismic. Long acquisition and processing times and high cost result in few of these surveys being collected. CO_2 is often moving non-uniformly through the patterns as a result of naturally occurring heterogeneity, and the operator has no indication until the injected gas prematurely breaks through at one of the producing wells in that pattern. The direct cost of that CO_2 is wasted, but more importantly, the opportunity cost of not using that CO_2 to produce a greater quantity of oil is much, much larger.

This new surveillance technology is based on, and takes advantage of, the unique properties of Krauklis Waves. These waves have long been observed in conventional seismic activities, particularly in cross-well seismic, but were most often filtered out as noise. Seismos is building an entire science around these waves, and uses them to interrogate the formation between all well pairs in the field. This is done through a cloud-based acquisition and processing platform that uses a small sensor placed on every well in the CO_2 flood project. The sensors acquire, process and map the CO_2 flood front extent for the production geologists and engineers, on demand, and present it to them through a web-based portal.

Seismos's unconventional technology slashes the acquisition, processing and interpretation time to days and at significantly lower costs than traditional methods.