

**B03 Building Seismic Monitoring Pilots for Production Risk Assessment***Christian Hubans, Total*

The classical application of 4D seismic is to monitor a field for a given scheme of development. This can be done at discrete time intervals or in a pseudo-continuous way like in the LOFS acquisition design. The latter application is only feasible for limited area and in marine environment due to the cost of on shore sources.

In the case where production mechanism is not perfectly well defined or where new mechanisms are experimented for EOR process, production engineers plan an industrial experimentation on small area and a short time (6 months to 5 years). A monitoring plan of these pilots is commonly built but the seismic tool is rarely fully used.

This is why we propose to develop pilots monitored by a continuous seismic data acquisition. Indeed, this type of situation is typical with “exotic” production schemes like SAGD, Polymer injection or WAG. During the pilot phase it is very important to acquire as much information as possible regarding production parameters like pressure and production flow and to assess the geological risks like heterogeneities, barriers, fractures, and any kind of anisotropy regarding production mode. Observation wells are drilled and equipped with many types of sensors but the understanding of production phenomena between wells is very crucial.

This pilot phase should be as short as possible in order to create the least delay in full field development but should bring as much information as possible to prevent risk in the production phase. The seismic monitoring is a key tool to solve this contradictory constraints.

To minimize the delay, it is essential that the monitoring should start as early as possible during the production pilot, but the seismic acquisition should be as informative as possible this is why we propose to use continuous acquisitions.

Along this line Total has already studied a monitoring of anomalous amplitudes based on a special design of acquisition for an on shore WAG production and a continuous sources and receivers acquisition to monitor a SAGD production pilot..

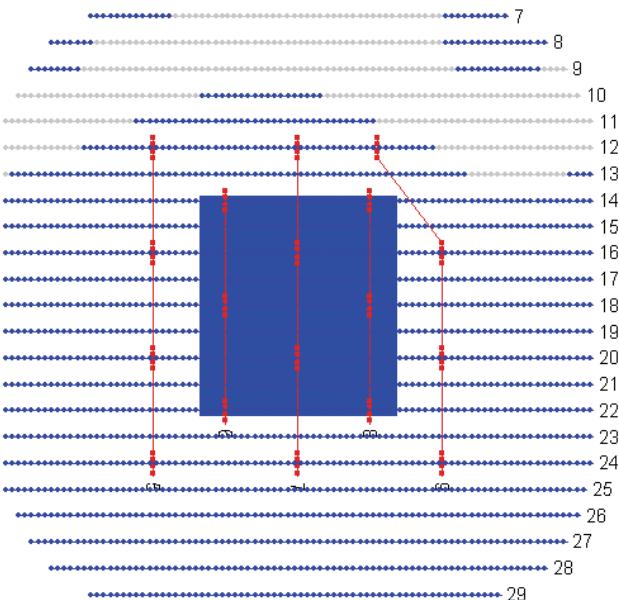


Fig1 : Example of permanent seismic design on a Pilot of production SAGD by horizontal wells. Red dots are source positions, blue dots are receiver positions.