

PERMEABILITY MEASUREMENT FROM SURFACE INTERFERENCE TESTING



Interference testing is the process of injecting or withdrawing reservoir fluid, usually from a single well, while monitoring the effects on fluid pressure in surrounding wells. It is particularly useful in determining the directional nature of permeability. At least three monitoring wells are theoretically required to determine the full directional nature of permeability.

In its simplest form, interference testing involves drilling a central injection hole and surrounding it with three monitoring wells, set at an appropriate distance away. Typically packers mounted on a tubing string are used to isolate the injection zone. The monitoring wells are fitted with pressure transducers which are either set between packers or cemented in place. Injection into the central well takes place until a clear pressure response is seen in the observation wells. Pressures are then allowed to recover, and analytical techniques used to determine the directional permeability and compressibility (or storage behaviour) of the reservoir.

This technique can also be applied to a well that is produced from, as opposed to injected into. Where gas caps exist in the coal seam, production is the only practical option. For the production wells case, the testing is usually run over a longer period in order to yield the effects of permeability change due to dewatering and shrinkage. The process required to arrive at the reservoir behaviour is usually one of history matching.

Sigra can also undertake interference tests, either in isolation or as part of production monitoring programme. Sigra possesses the requisite capabilities for reservoir monitoring and supply of injection equipment hardware, including the analytical skills to interpret the results.

