# Early Detection of Gas Well Formation Damage, Water Breakthrough and Liquid Loading by Use of Surface Pressure Build-Up Data

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Abstract

Gas well performance can deteriorate or improve as a result of changes in inflow and outflow. Early detection of such changes allows timely recognition of their impact on the production forecast and, if necessary and justified, timely execution of remedial activities. This article will demonstrate how comparison of subsequent surface pressure build-up (S-PBU) periods reveals either onset of formation water production and/or liquid loading and that can be use to estimate WGR. The S-PBU data can also be transformed into a dynamic inflow performance relation (D-IPR). It will be demonstrated how the evolution of this D-IPR reflects changes in inflow performance either due to impairment or due to stimulation. In addition, the D-IPR provides an independent measure of the gas production rate prior to shut-in. And best of all, this data is abundant, typically free of charge and easily digestible.

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