

CASE STUDY OF THE HILTPOLD #2 GAS STORAGE CAVERN TEMPERATURE FEATURE

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Abstract

A routine 5-year MIT (Mechanical Integrity Test) was performed on the Hiltpold #2 at the Markham salt dome 90 miles southwest of Houston, TX in the fall of 2007. Shortly, after completion of the test, the testing company expressed concern about a temperature log that showed a “Departure from Temperature Linearity.” This concern was based on a paper presented at the Fall 2007 SMRI meeting titled “A Case History of the Threaded Coupling Production Casing Failure in Gas Caverns – Part 1: Detection and Geomechanical Analysis”. That paper presented a method that related a known gas leak to a method referred to as a “Departure from Temperature Linearity” as a way of identifying leaks. The temperature survey performed as part of the MIT on the Hiltpold #2 well showed a similar temperature profile, which the testing company noted as a temperature anomaly. To further investigate, a longer 28-day MIT was performed on the well.

This paper summarizes the MITs and provides Kinder Morgan’s analysis. Subsequent to the two gas MITs, the cavern was refilled with brine and two nitrogen/brine interface tests were performed. These two tests proved that there was no leak at Hiltpold #2 and the temperature feature was not due to a leak.

The Gas Storage Technology Consortium has funded a study to further investigate utilizing “Departure from Temperature Linearity” as a method for identifying leaks in gas caverns.

Key words: Cavern Testing, Caverns for Gas Storage, Leak, MIT (Mechanical Integrity Test), Well Casing, Well Logging

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