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Dissolution of a problem at Peckensen

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Abstract

Storengy, an affiliate of the GDF SUEZ group, develops, constructs, markets and operates underground gas storages. Among other locations Storengy develops and operates the Peckensen salt cavern storage.

Out of over 30 wells drilled through Peckensen domal salt structure, ERG2 was the first one where carnallite salt was found at the storage cavern depth. Two neighboring caverns are in operation, two are currently being leached, none of them has any carnallite indication at comparable depths. Decision was taken at Storengy, together with the engineering company in charge with the leaching Untergrundspeicher- und Geotechnologie-Systeme GmbH, to develop the cavern and the initial design was adapted to the current situation. The development was satisfactory, with the creation of two caverns (one below and one above the carnallite) linked by an 8-10 m (26-33 ft) diameter neck at carnallite depth.

Late in the solution mining of the upper cavern – completed in 2009 –, a block of salt neighboring carnallite fell down from the wall of the cavern and blocked access to the lower cavern part, thus preventing gas-filling of this cavern part accounting for approximately 1/4 of the total volume. After gas first filling of the upper cavern part Storengy cleared the obstruction using specially adapted SMUG techniques. Prior to SMUG the obstruction had been drilled. Taking advantage of gas compressibility, the debrining string was used for both water injection and brine withdrawal. This configuration allowed only for discontinuous leaching with half-cycles of water injection followed by half cycles of brine withdrawal (the gas/brine interface being moved within a cycle). Implemented SMUG techniques included leaching trough a specially designed tail pipe extension and leaching with a snubbing unit.

The successful application of these techniques allowed gas first-filling of the lower cavern part so that the entire cavern volume can be now used without any restriction for storage operation.

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