

Natural Seals Research and Test Well

Publieke samenvatting / Public summary

Aanleiding

Durable and more economic P&A solutions for annular sealing and well plugging would have a beneficial impact on the feasibility and economic competitiveness of promising sustainable geo-energy options, such as geothermal energy or gas storage. Recent research focusing on safe and durable P&A options identified bentonite as a promising seal for wellbores in deep subsurface geo-energy applications. The overall advantages of using natural materials such as bentonite or rock salt over cement are their long-term sealing capacities and stability under downhole conditions. The knowledge about alternative natural sealing materials is increasing, paving the way for innovative well constructions and use of alternative sealing materials for zonal isolation and P&A of wells. The application of bentonite is generally expected to require less expensive placement equipment, lower material costs and monitoring. However, a dedicated plugging methodology for deep O&G wells does not exist.

Doelstelling

The project proposed here aims to perform downhole qualification tests of the sealing properties of bentonite-based well plugs at relevant P&A conditions at the at the former Shell Well Technology Research Centre equipped with large-scale testing equipment and research well including a drill-rig. The test location located in Rijswijk , offers a unique opportunity to test and demonstrate new wellbore sealing materials for P&A, placement concepts and monitoring technologies. The proposed downhole testing presents an opportunity

Projectinformatie / Project information

Projectnummer / Project number

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Subsidiebedrag / Grant amount

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Algemene informatie / General information

Penvoerder / Secretariat

TNO

Publicaties en materialen / Publications and attachments

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for verification of the legal conformance of the proposed methodology, which can enable a near-future application of natural seals for wellbore sealing.

Korte omschrijving

Although bentonite plugging is common practice in other domains, like water wells and nuclear waste disposal and its application for O&G has been considered, verification of the sealing performance at high pressures and high temperature relevant for P&A of hydrocarbon wells (in NL) is lacking. Lab tests are conducted but upscaling from lab- to field-scale, which requires downhole testing, is required to investigate the sealing performance under actual downhole conditions. Innovations with respect to placement and improved sealing performance are needed. Verification of the sealing capacity (as required from regulations) of bentonite plugs under actual downhole conditions are required, which should include experimental investigations of the formed plugs besides the sealing tests in the wellbore itself.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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