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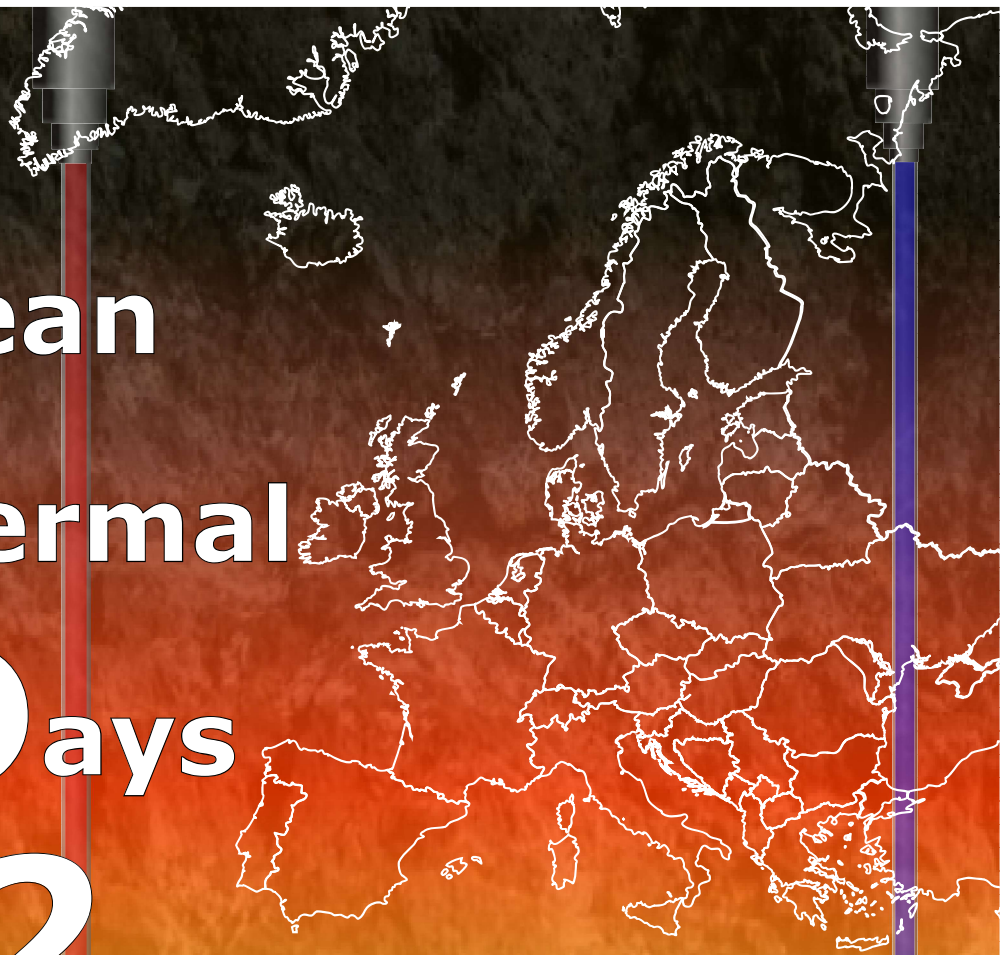

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Clogging mechanisms in geothermal operations: a case-study of a geothermal field in the Netherlands

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The number of geothermal operations worldwide has been actively growing over the last decades. To increase their efficiency, prevent reservoir depletion and avoid environmental issues, produced water is commonly reinjected. Despite these benefits of fluid reinjection, various clogging problems resulting in injectivity decline have been reported by field operators. Research on individual clogging mechanisms is published in various studies. However, fluid injectivity problems are still widely faced, leading to decreased overall productivity and even abandonment of some wells. Therefore, it is essential to better understand reasons of fluid pathway clogging processes and especially their interactions to efficiently predict and prevent them.

In this research, we present a theoretical analysis of different clogging mechanisms. The influence of various parameters on different clogging mechanisms from existing experimental studies and field reports has been reviewed and summarized. Additionally, we compared these experimental literature concepts with a real case study of a running geothermal field facing clogging problems in the Netherlands. The study includes a detailed analysis of production data, as well as fluid and filter sample analyses. Results show correlation patterns between concentration changes of chemical species in the fluid, as well as influence of injection parameters (temperature, flow rate) on injectivity. The outcomes were compared to literature examples to generalize the conclusions. This will allow an improved understanding of processes occurring in geothermal fluids during fluid production and reinjection. As a next step of this research, more field data will be analyzed to identify similar trends and correlations as well as the interdependency of injectivity problems.