Injection of geothermal CO\textsubscript{2} and H\textsubscript{2}S gases at the Nesjavellir site: A pre-injection overview

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Injection of CO\textsubscript{2} and H\textsubscript{2}S waste gases emitted from the Hellisheidi Power Plant through their dissolution in water has been ongoing since 2014. The gas-charged fluid is injected into the basaltic subsurface where the gases precipitate as minerals for safe and long-term storage. The method has been developed within the CarbFix project and demonstrated its efficiency in the rapid mineralization of these gases at Hellisheidi, SW-Iceland.

Plans are to start injection of CO\textsubscript{2} and H\textsubscript{2}S emitted from the Nesjavellir Power Plant, a plant that is located about 10 km north of the Hellisheidi Power Plant, but both plants utilise the geothermal system of the Hengill volcano. Preparation of a pilot injection of \sim 1000 tonnes of a 65\%CO\textsubscript{2}-35\%H\textsubscript{2}S gas mixture is in preparation as a part of the EU-funded GECO project.

Building upon previous studies and experience gained through the CarbFix injections at Hellisheidi [e.g. 1, 2, 3] we present here a geological overview of the Nesjavellir injection site, fluid chemistry at the site and the predicted chemistry of the injected fluid. The water-CO\textsubscript{2}-H\textsubscript{2}S basalt interaction taking place in the geological formation is then assessed through geochemical simulations to predict the fate of the injected gases in the subsurface.