

## **Supplementary Information**

### **Rapid CO<sub>2</sub> mineralisation into calcite at the CarbFix storage site quantified using calcium isotopes**

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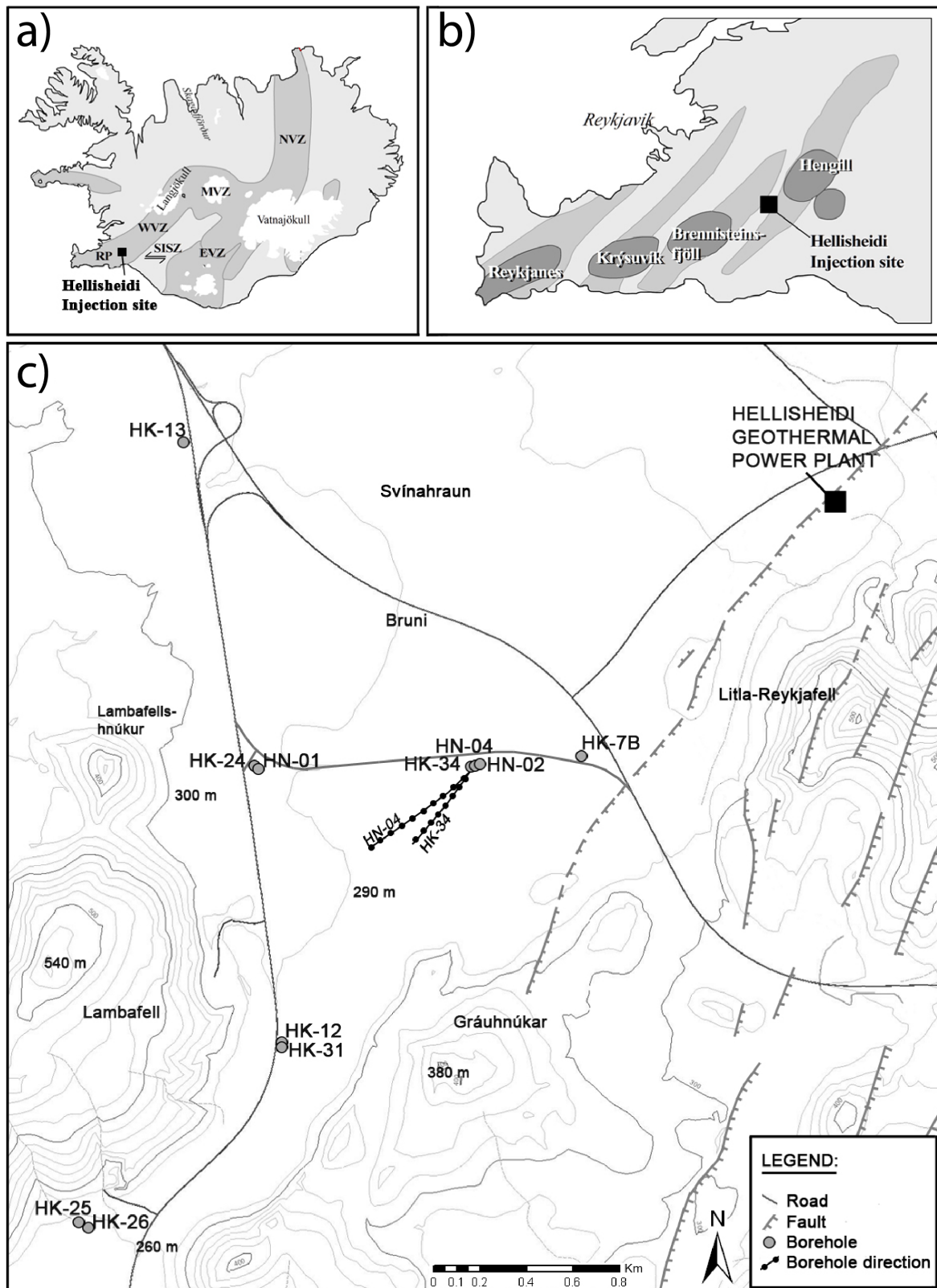
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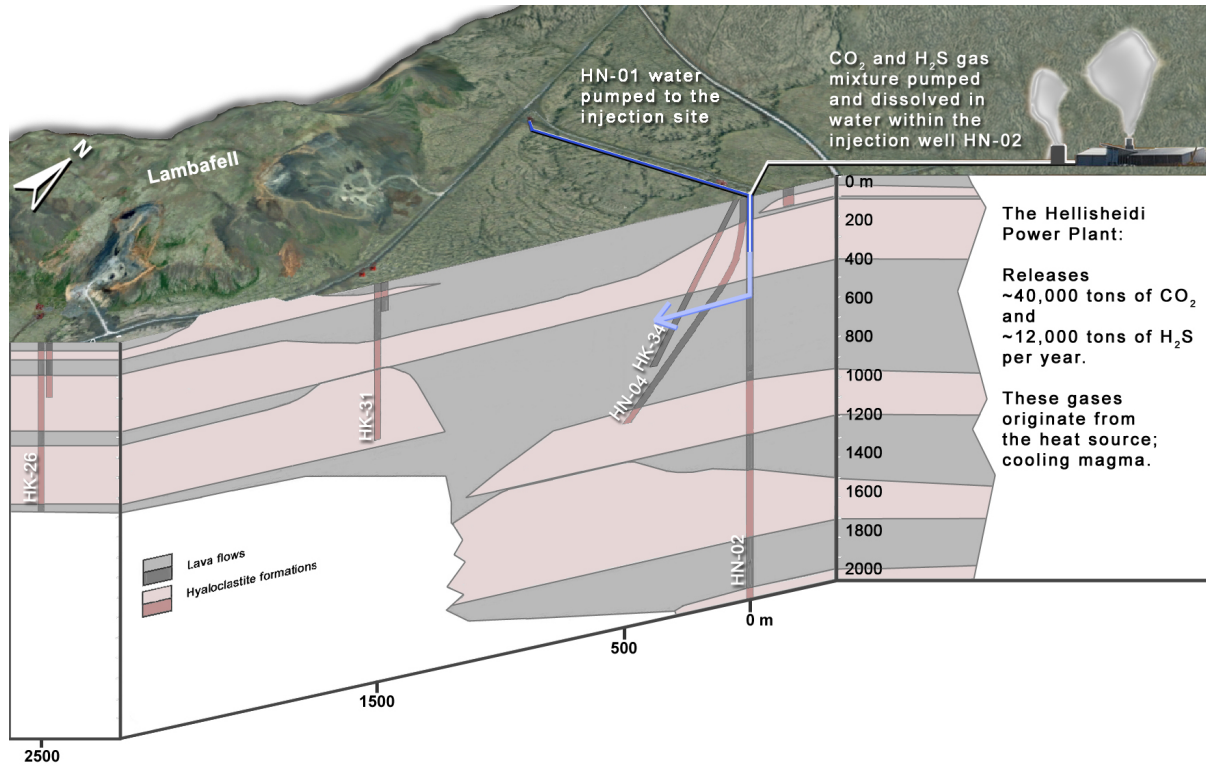
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Supplementary Figures

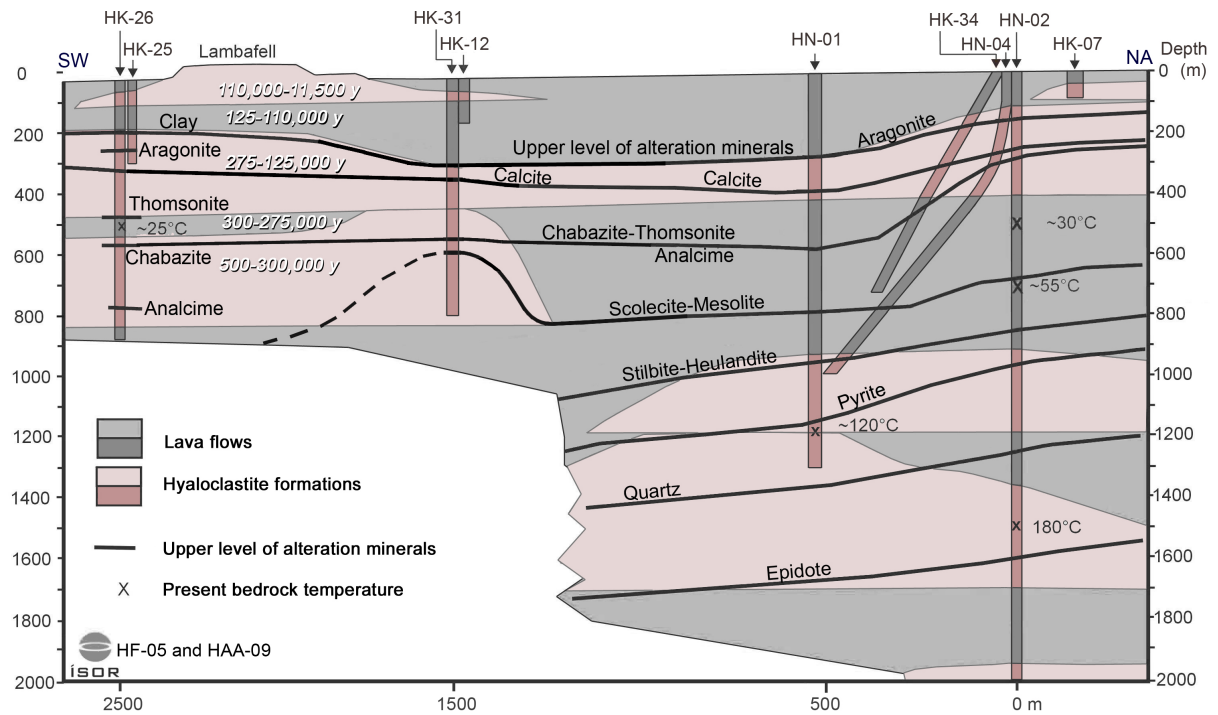


Supplementary Figure 1. Maps showing location of the study area (a) Map showing active volcanic zones in Iceland: RP = Reykjanes Peninsula, WVZ = Western Volcanic Zone, SISZ = South Iceland Seismic Zone, MVZ = Mid-Iceland Volcanic Zone, EVZ = Eastern Volcanic

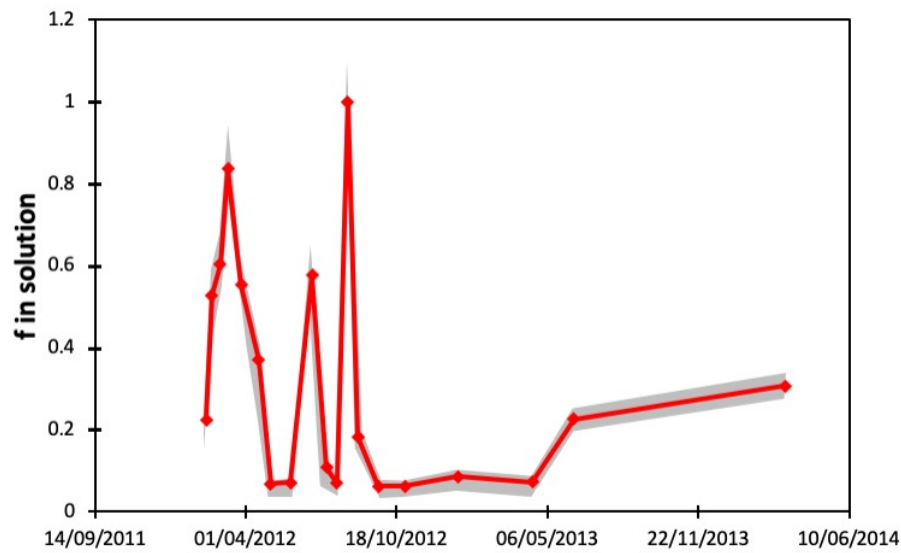
Zone and NVZ = Northern Volcanic Zone. (b) Map showing location of central volcanoes (dark gray) on Reykjanes Peninsula and associated fissure swarms (gray). (c) Map of the CO<sub>2</sub> injection site in, Hellisheidi, SW-Iceland. The CarbFix wells are shown as labeled gray dots. Mapped bedrock faults are located toward east and are part of the Hengill fissure swarm. From Alfredsson et al., 2013<sup>1</sup>.



Supplementary Figure 2. Geological cross section of the CarbFix injection site. The CO<sub>2</sub> was co-injected with water from well HN-1 within the injection well HN-2. Modified from Alfredsson et al., 2013.



Supplementary Figure 3. Geologic cross section showing the stratigraphy of the CarbFix injection site. The location of the CarbFix wells are shown in the figure; HN-2 is the injection well, HN-1 is the water source well (1 km toward west) and HN-4, HK-34, HK-31, HK-25, HK-7b, HK-12 and HK-25 are monitoring wells. The major stratigraphy consists of hyaloclastite basalt formations (brown) and crystalline basalt formations (gray). Estimated ages of the rocks are provided in the figure. The first appearances of secondary mineral formations in the host rocks are shown as black lines. The bedrock temperature at around 500 m depth is ca. 30°C in HN-2 rising to 180°C at around 1500 m depth. From Alfredsson et al., 2013.



Supplementary Figure 4. Calculated values of  $f$  with time. The grey shaded areas represent the propagated 2s.e. uncertainty.

- 1 Alfredsson, H. A. *et al.* The geology and water chemistry of the Hellisheidi, SW-Iceland carbon storage site. *International Journal of Greenhouse Gas Control* **12**, 399-418, doi:10.1016/j.ijggc.2012.11.019 (2013).