

## Abstracts of Additional Geothermal Session Papers

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### Molten Rock Drilling

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The Sandia Magma Energy Project has resulted in the conclusion that it is scientifically feasible to extract energy from magma resources buried within the top 6.2 mi (10 km) of the earth's crust. Supporting that conclusion were the ten holes that have been drilled successfully into the melt zone of Kilauea

Iki Lava Lake. One recent hole was drilled and cored through the entire 98-ft (30-m) thick molten zone.

Two novel drilling systems were developed. The first used an insulated drill stem with an uncooled superalloy drag bit. This system was tested successfully in the laboratory at magma temperatures but never used in the field. The second system used standard drill pipe, a modified core barrel, and a water jet-augmented face discharge diamond coring bit. A high rate of water flow was used to cool the drill stem and solidify the molten rock as the bit advanced. This system was laboratory tested and successfully used to drill 5 holes (345 ft [105 m]) in the molten rock zone of Kilauea Iki, where the temperatures were above 1,020°C. Core recovery was 100%.