

Description of Additional Supplementary Files

Supplementary Data 1: Review of existing ages on distal tephra and correlation.

Supplementary Data 2: Melt inclusions geochemistry.

Supplementary Data 3: Samples overview reporting the sample name, site location, belonging unit name and brief description of the depositional facies.

Supplementary Data 4: Primary total-gas Ar/Ar ratio data including the irradiation parameters (J) and all isotopes from ^{36}Ar to ^{40}Ar .