**Table S2** Information of apatite fission track samples

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lab No. | Field No. | Lon. | Lat. | Elevation | Lithology | Depositional / Eruption Age |
| (m) |
| GL-19 | BD126-R1 | 88.025731 | 34.458539 | 4936 | Sandstone | Middle Jurassic (J2*x*) (164-161 Ma) |
| GL-20 | BD051-R1 | 88.427025 | 33.765019 | 5197 | Sandstone | Middle Jurassic (J2*x*) (164-161 Ma) |
| GL-21 | BD014-R1 | 88.486269 | 34.097064 | 4983 | Sandstone | Middle Jurassic (J2*x*) (164-161 Ma) |
| GL-23 | BD001-R2 | 88.501106 | 34.476622 | 4928 | Sandstone | Middle Jurassic (J2*x*) (164-161 Ma) |
| GL-24 | BD211-R1 | 88.329283 | 33.820122 | 5001 | Sandstone | Middle Jurassic (J2*x*) (164-161 Ma) |
| H-2 | D116-R1 | 89.61334 | 34.22052 | 5229 | Sandstone | Late Jurassic-Early Cretaceous (J3K1*x*) (155-99 Ma) |
| H-3 | D121-R1 | 89.63888 | 34.29572 | 5258 | Sandstone | Late Jurassic (J3*b*) (161-145 Ma) |
| H-4 | D135-R1 | 89.596 | 34.57135 | 5176 | Sandstone | Late Jurassic (J3*b*) (161-145 Ma) |
| H-12 | D077-R1 | 89.232933 | 34.038350 | 5314 | Granite | Eocene (47-38 Ma) |
| H-15 | D221-R1 | 89.316711 | 33.861667 | 5342 | Granite | Eocene (47-38 Ma) |
| H-16 | D231-R1 | 89.56643 | 34.69134 | 5065 | Sandstone | Late Jurassic-Early Cretaceous (J3K1*x*) (155-99 Ma) |
| H-17 | D243-R1 | 89.65763 | 34.85783 | 5243 | Sandstone | Late Jurassic-Early Cretaceous (J3K1*x*) (155-99 Ma) |
| H-18 | D257-R1 | 89.69914 | 35.05416 | 4945 | Sandstone | Middle Devonian (D2*Y*) (397-385 Ma) |