

**SUPPLEMENTAL TABLE 1.** Sample localities for all reentrants used in this study

Eruption	Sample locality	Latitude/Longitude	Samples collected or re-collected	Location description
Bishop	25	37.545386° N 118.592387° W	BTMM F2–5, F4–5	West side of Owens Gorge near Upper Power House penstocks. Thick section of F1 to F6. Capped by Ig1Eb ignimbrite.
Bishop	22	37.408818° N 118.493665° W	BTMM F7–1	Chalk Bluffs. Fall deposit stratigraphy present from F1-F9, with thick Ig2E ignimbrite on top.
Bishop	876	37.772230° N 118.519427° W	BTMM F8–2	Disused pumice pit in Blind Spring valley. Exposure of F7-F9 with interbedded IgE1b and capping Ig2E. Sampled 12–17 cm from F8/F9 contact, below the first appearance of Glass Mountain rhyolite lithics.
Bishop	764	37.518558° N 118.324267° W	BP138, BP141	Disused pumice pit on western slopes of the White Mountains. 2.1 meter-thick exposure of F9 with a thin (~1 cm) interbedded layer of Ig2Eb ignimbrite.
Oruanui	2288	38.656900° S 176.029402° E	Additional sample of the P1970 and P1971 layers	Punatekahi scoria quarry. Fall Phases 1–3 are present, with interbedded flow materials in phases 2 and 3.

				Phase 7 ignimbrite erosively overlies these units
				Natural exposure. Phases 1 to 3 present, with thin ignimbrite and other pyroclastic density current deposits interbedded with fall deposits of phases 2 and 3.
Oruanui	2751	38.699660° S 175.999062° E	P1958-P1971 (same levels as used in Allan et al. 2012)	
Oruanui	1086	38.882998° S 176.077834° E	P2305 whole pumices	Cut face alongside Hinemaiaia C dam. Coarser zone in Phase 3 ash-rich pyroclastic density current deposits sampled.
Huckleberry Ridge	5	44.974323° N 110.664595° W	MM3-MM11 YP287	Lower 1.8 meters of Total 2.5 meter fine-grained fall deposit below thick, welded ignimbrite member A. See Myers et al. (2016) for sampling details.