

Neogene Basin Development in the Waqia Valley, Southeast Pamir

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Recent fieldwork along the north-northwest trending Waqia Valley in the southeast Pamir has identified a thick sequence of Neogene deposits in an extensional basin. Stratigraphic and structural relationships change within the basin from north to south. Along the northern end of the Waqia Valley, Neogene lacustrine and fluvial sediments with a minimal thickness of

~250m overlie basement schists and marbles above a buttress unconformity interpreted to reflect infilling of the paleotopography of the valley. These Neogene sediments are deformed by a west-facing monocline along the eastern margin of the valley. To the south, the eastern side of the Waqia Valley is bound by a steeply

west-dipping normal fault, the Waqia Fault. Subsidence of the hanging wall has accommodated $\geq 1000\text{m}$ of Neogene sediment fill in a half-graben. Neogene sediments grade from fluvial/lacustrine deposits in the center of the valley to cobble/boulder conglomerate fans with landslide blocks of presumed footwall lithologies in the east, adjacent to the fault. Slickenside lineations on minor faults within the basin deposits adjacent to the Waqia Fault show both normal and strike-slip components. While highly degraded scarps at the south end of the Waqia Fault suggest recent activity along a portion of the fault, Quaternary terrace deposits in the vicinity of the monocline and along the northern half of the Waqia Fault show no evidence of recent deformation. Timing of the Waqia Fault and associated basin sediments is unknown. However, structural and stratigraphic relationships of

the fault and associated Neogene deposits suggest it is likely Late Miocene to Pliocene in age. Regionally, the Waqia Valley occurs along the strike of the interpreted northwest extent of the Karakax Fault and the southeast flank of the easternmost Central Pamir gneiss dome. We suggest two possible models for the development of the Waqia Fault and associated basin deposits: (1) The Waqia Valley is a releasing-bend associated with regional left-lateral strike-slip deformation at the western section of the Karakax fault. This model, however, is inconsistent with regional kinematic architecture of the Karakax Fault, which requires the presence of a transpressional fault in the area. (2) The Waqia Fault and basin development are kinematically related to the development of mid-Miocene Central Pamir gneiss domes. ■