

IRP01

## Tectono-stratigraphy and structure of the northwestern Zagros collision zone across the Iraq-Iran border

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### SUMMARY

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Tectono-stratigraphic units within the Zagros orogen in northeast Iraq (foreland) and northwest Iran (hinterland) are correlated to provide an integrated map along the collision zone. Structural cross-sections across the Zagros suture zone reveal the relationships between the tectonic terranes of various ages and different origins. Terranes of oceanic affinity have accreted onto the Arabian plate during collision-accretion events that started in the Late Cretaceous. The collision resulted in closure of the Neo-Tethys Ocean and the construction of a structurally complex suture zone. Jurassic-Cretaceous deep ocean radiolarites of the Qulqula-Kermanshah terrane and ophiolitic mélange serpentinites were structurally accreted against the Arabian passive margin in the Late Cretaceous during an ophiolite arc-continent collision event. The overthrust radiolarites and ophiolitic mélange terranes initiated the development of the foreland basin overlap flysch (turbidites) and molasse assemblage on the now active Arabian margin.

Paleocene-Eocene volcanosedimentary rocks of the Walash-Naopurdan-Kamyaran terrane developed as an intra-oceanic island-arc within the intervening Neotethys Ocean. They now structurally overlie the older ophiolite mélange and radiolarite terranes as a result of continued convergence onto the margin of the Arabian Plate. These younger thrust sheets and nappes have been transported over the Miocene molasse unit of the Tertiary Red Beds in flexural foreland and covered the late Cretaceous accretionary complex terrane-foreland basin assemblages. The Qulqula-Kermanshah terrane is exposed in a tectonic window at the northeastern part of the mapped area indicating that the late Cretaceous accreted terranes occur below the Walash- Naopurdan-Kamyaran thrust sheet. Late Cretaceous ophiolite massifs-bearing terranes named the “Upper Allochthon” (i.e. Gemo-Qandil nappe, 97-118 Ma) are emplaced by younger thrust sheets over the Paleocene-Eocene Walash-Naopurdan-Kamyaran terrane by out-of-sequence thrusting. Mesozoic metamorphic rocks of the hinterland including volcanic and intrusive rocks of the active Iranian continental margin (Sanandaj-Sirjan zone), collided in the Miocene due to continent-continent collision and occur in the youngest nappes and klippen along the Zagros suture zone.

This is the first effort to correlate the tectonic units in this area. Detailed geological information has been compiled for the first time across the Iraq-Iran border by using the published larger scale geological maps from both regions to give correlation between tectonic units. The tectono-stratigraphic units recognized across the border. Tectonic terranes of the Zagros suture zone are identified and named. Structural cross-sections are presented to demonstrate the thrust sheets relationships and ages of convergent tectonic events due to collision along the northeast Iraq and northwest Iran border.

