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Geometry of the Western Termination of the Wichita Mountain Front

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The Wichita Mountain Front terminates near the OK-TX state line in the area of West Mayfield and Mills Ranch Fields. The termination is accomplished by a series of down-stepping blocks bounded by high-angle compartmental faults. The compartmental faults are oriented at a high-angle to the NW-SE strike of the mountain front. The down-stepping blocks have a "trapdoor" geometry and are thrust to the northeast. Moving west, each successive block accommodates less NE-SW shortening. West Mayfield is the last block in the series. It is bounded to the north by a low-angle, southwest-dipping thrust and to the west by a steeply-dipping compartmental fault. West of the compartmental fault, the basement appears to die into a fault-fold interchange that plunges to the west. West of this interchange, the basement forms a broad syncline, open to the north. The Mills Ranch Anticline is located within this mountain front syncline. Mills Ranch Anticline is detached within the Arbuckle (Ellenberger) and is thrust out of the syncline to the southwest. In the area between West Mayfield and Mills Ranch, the detachment which brings up the Mills Ranch Anticline climbs up the steep forelimb of the plunge terminus of the Wichita Mountain Front. The effect is to form a culmination that is structurally separated and elevated from the main Mills Ranch structure to the west.