60 mi (97 km) north of Albuquerque. The caldera is a prominent geologic structure in the Jemez Mountains, a complex volcanic highland of Pliocene and Pleistocene age. Surficial evidence of geothermal resources includes the widespread distribution of rhyolitic volcanics in space and time, large areas of hydrothermally altered rock, and hot springs and gas seeps. Nineteen geothermal wells have been drilled in the caldera. The principal geothermal resource discovered is a liquid-dominated, under-pressured system with base temperature in excess of 260°C, and salinity on the order of 6,000 ppm total dissolved solids. A maximum temperature of 330°C has been measured. Some wells have encountered a vapor-dominated reservoir overlying the liquid-dominated reservoir. Production is principally from fractures in the lower part of the rhyolitic Bandelier Tuff. Typical wells are 5,000 to 9,000 ft (1,525 to 2,745 m) deep.

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Paleokarst Controls on Localization of Uranium at Pitch Mine, Sawatch Range, Colorado

The Pitch Mine is located at the southwestern end of the Sawatch Range in south-central Colorado. Currently being developed by Homestake Mining Co., the deposit has 7 million lb (31.5 million kg) of U_3O_8 delineated reserves. The uranium mineralization largely occurs in the black organic-rich matrix material of carbonate breccias. These breccias have previously been described as Pennsylvanian Belden Formation "fault breccias." They are, however, morphologically similar to the Upper Mississippian fossil karst breccias within and on top of the Mississippian Leadville Formation, which host silver and base-metal mineralization in several areas of the Sawatch Range.

Paleokarst relief is well exposed on the Leadville Formation within a few miles of the Pitch Mine. The karst features include lines of what appear to be karst towers with their associated sinkholes and rare preserved red-soil breccias. The towers are morphologically similar to other Late Mississippian karst towers in the Molas Lake area of southwestern Colorado.

The carbonate breccias formed by surface karst weathering, as washed-in cave and sinkhole fill, and by sinkhole collapse. The black clayey matrix material was deposited in the lakes and swamps of a drowned karst regime such as the Everglades and sinkhole lake country of the Florida Peninsula today.

Both the mineral assemblage and alteration at the Pitch are limited, indicating a low-temperature origin for the uranium.

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Coal Variations in Fluvial Deposition of Paleocene Tongue River Member of Fort Union Formation, Powder River Area, Wyoming and Montana

The coal-bearing Tongue River Member of the Fort Union Formation in the Powder River basin exemplifies fluvial deposits of Tertiary intermontane basins. The Tongue River Member coals are targets of extensive drilling exploration and development. About 200 sections, spaced an average of 0.5 mi (0.8 km) apart, were measured in a 60-mi (96 km) continuous outcrop along the Powder River in Wyoming and Montana to determine the environmental-stratigraphic framework of the coals in the 1,500-ft (450 km) thick Tongue River Member. Coal-bed distribution in this area may be typical of that in many parts of the basin.

The coals are distributed in two major facies: a lower (1,100 ft or 330 m thick) fluvial channel dominated facies, and an upper (400 ft or 120 m thick) lake-dominated, interfluvial and fluvial channel facies. Major coals, including the Anderson, Canyon, Cook, Wall, Pawnee, and Cache, were formed in the fluvial channel dominated facies, which contains numerous en echelon channel sandstones that range from 50 to 200 ft (15 to 60 m) thick and from 1 to 9.5 mi (1.6 to 15.2 km) in lateral extent. The offset arrangement of the sandstones suggests shifts of meandering channels among low-lying poorly drained interchannel backswamps which were filled by overbank-crevasse sandstone, siltstone, and shale. These backswamps, as well as poorly drained backswamps developed on abandoned channel ridges, were sites of coal deposition. Coal beds in this facies locally thicken from 1 to 30 ft (0.3 to 9 m) within 3 to 7 mi (4.8 to 11.2 km) and were traced in outcrops for 8 to 12 mi (13 to 19 km) as lenticular bodies. They split laterally, grade into carbonaceous shale, or are truncated by channel sandstones.

The lake-dominated interfluvial and fluvial channel facies consist of abundant crevasse-splay sandstone, siltstone, and shale, and lacustrine limestone and shale that contain abundant freshwater mollusks. A few channel sandstones are present; these range from 30 to 80 ft (9 to 24 m) thick and from 0.5 to 3 mi (0.8 to 4.8 km) across. The crevasse and channel deposits developed poorly drained to well-drained backswamp platforms where coals formed. Coal beds, including the Smith and Roland, average about 2.5 ft (0.7 m) thick and are laterally continuous in outcrops for as much as 5 mi (8 km). Crevasse splays dominated the interfluvial-lacustrine sedimentation and commonly interrupted lateral continuity by splitting the coal beds.

Thus, of the two major facies, the more coal productive is the fluvial channel dominated facies. The development of thick, lenticular coal beds in this facies was directly influenced by depositional settings of poorly drained backswamps which formed mainly on abandoned channel ridges and overbank areas.

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Geology of Paleozoic Strata in West-Central Saskatchewan

The study area is located just south of the Precambrian shield between the Meadow Lake escarpment and the Alberta-Saskatchewan boundary. It is approximately 350 km long and 70 km wide and constitutes part of the Middle Devonian Meadow Lake basin, which is the southeastern portion of the early Elk Point basin. The Paleozoic strata comprise clastic rocks of the Cambrian Deadwood Formation and dominantly carbonate rocks