



CORRELATION OF MAP UNITS

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| Qal | Quaternary | Quaternary |
| Ki | Cretaceous | Cretaceous |
| Pst | Permian | Permian |
| Pso | Permian | Permian |
| Psi | Permian | Permian |
| Psl | Permian | Permian |
| Pm | Missourian | Missourian |
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DESCRIPTION OF MAP UNITS

Block outcrops are common, but of limited extent. In road places the bed rock is covered by a relatively thin layer of surficial materials (soil, residual, and colluvium), which were not mapped.

- Aluminum (Holocene)**—Unconsolidated, sorted or semi-sorted alluvial clay, silt, sand and gravel.
- Lamprote trilobites (Cretaceous)**—Dikes and sills intruding Pennsylvanian rocks in southern Woodson County. At Silver City dike, porphyry consisting of phlogopite, opacite, potassic richterite, serpentine pseudomorphs after olivine, and chrome spinel in a groundmass of mostly serpentine (Culler and others, 1965); rocks at Rose dike, weathered, soft, and olive-brown. At Rose dike, known only from drill samples, porphyry consisting of 25 percent or more phlogopite and less than 5 percent each of olivine, diopside, augite, and amphibole, in a dolomitic, serpentinized groundmass (Hills and others, 1991).
- Shannon Group (Upper Pennsylvanian; Virgilian)**
 - Calhoun Shale**—Dark gray, sandy shale 5-10 ft thick.
 - Deer Creek Limestone**—Composed of five members. Uppermost is Ernie Creek Limestone Member, which is light gray to bluish gray, wavy-bedded, and fossiliferous and contains some chert, 6-8 ft thick. Larch and Burdock Shale Member is a gray to dark gray shale 2-3 ft thick. Rock Bluff Limestone Member is massive, dark blue, and fossiliferous, containing numerous fusulines 2-3 ft thick. Osolonia Shale Member is sandy and micaceous, gray shale 10-15 ft thick. Ozark Limestone Member is brownish and massive and averages 5 ft thick.
 - Tecumseh Shale and Leighton Limestone, undivided**
 - Tecumseh Shale**—Gray shale containing some sandstone in upper part, averages 15-25 ft thick.
 - Leighton Limestone**—Composed of seven members, top to bottom: Uppermost is Shal Shale Member, which is reddish gray and 1.5-1.5 ft thick. Red Limestone Member is bluish and highly fossiliferous, averaging 8-10 ft thick. Green Hill Shale Member is gray and averages 3-6 ft thick. Big Springs Limestone Member is bluish gray and dense and 1-3 ft thick. Doniphan Shale Member is mostly bluish and in part red, and is 6-10 ft thick. Spring Branch Limestone Member is sandy, weathers deep brown, and is 2-3 ft thick.
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 - Tecumseh Shale and Leighton Limestone, undivided**
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| SYSTEM | SERIES | LITHOLOGY OR FORMATION | FOLOIO NOTE | REFERENCES CITED |
|---------------|----------|---|--|--|
| Pennsylvanian | KANSAS | Shale, sandstone, limestone, and coal | This map is part of a folio of maps of the Joplin 1° x 2° quadrangle, Kansas and Missouri, prepared under the Continental United States Mineral Resource Assessment Program (CUMRAP). Other publications in this folio are: Kansas Geological Survey Miscellaneous Field Studies Map MF-2125-A through MF-2125-E, and Miscellaneous Investigations Series Map 1-2426-B, all dated with the subtitle geochemistry (Erickson and others, 1990). Industrial minerals (Kritsky and Reed, 1991), subsurface structure of the sedimentary rocks (Blair and others, 1992), geographically inferred structure and lithology of the Precambrian basement (McCauley and Cordell, 1992), mineral resource potential (Pratt and others, 1993), and coal resources (Bryant and others, 1994). | Berendsen, Peter, and Blair, K.P., 1991, Interpretive sub-crop map of the Precambrian basement in the Joplin 1° x 2° quadrangle, Kansas and Missouri, U.S. Geological Survey Miscellaneous Field Studies Map MF-2125-E, scale 1:250,000. McCauley, A.E., and Cordell, L.E., 1992, Geographically inferred structural and lithologic map of the Precambrian basement in the Joplin 1° x 2° quadrangle, Kansas and Missouri, U.S. Geological Survey Miscellaneous Field Studies Map MF-2125-D, scale 1:500,000. McCauley, J.R., Smith, D.C., and Robertson, C.E., 1990, Geology of the Joplin quadrangle, in Pratt, W.P., and Goldberger, M.B., U.S. Geological Survey-Missouri Geological Survey symposium—Mineral resource potential of the Midwest, Program and Abstracts, St. Louis, Missouri, April 11-12, 1989, U.S. Geological Survey Circular 1043, p. 17. McKnight, E.T., and Fisher, R.P., 1970, Geology and ore deposits of the Picher field, Oklahoma and Kansas, U.S. Geological Survey Professional Paper 588, 165 p. Miller, D.E., 1969, Geology and ground-water resources of Allen County, Kansas, Kansas Geological Survey Bulletin 195, 50 p., map scale 1:63,360. O'Connor, H.G., 1974, Geology and ground-water resources of Montgomery County, southwestern Kansas, Kansas Geological Survey Ground Water Series, No. 1, 12 p., map scale 1:63,360. Palmer, J.R., 1991, Distribution of lithofacies and inferred depositional environments in the Cambrian system, in Martin, J.A., and Pratt, W.P., eds., Geology and mineral-resource assessment of the Springfield 1° x 2° quadrangle, Missouri, as appraised in September 1985, U.S. Geological Survey Bulletin 1942, p. 9-38. Pence, W.J., and Coatsworth, 1958, Geology and coal resources of the southeastern Kansas field in Crawford, Cherokee and Labette Counties, Kansas Geological Survey Bulletin 24, 122 p., map scale approximately 1:95,000. Pratt, W.P., Hayes, T.S., Erickson, R.L., Berendsen, Peter, and Kivansky, E.B., 1993, Assessment of the Joplin 1° x 2° quadrangle, Kansas and Missouri, for Mississippi Valley-type deposits and other minerals, U.S. Geological Survey Miscellaneous Field Studies Map MF-2125-A, scale 1:250,000. Sevens, W.J., 1975, Description of the surficial rocks in Cherokee County, southwestern Kansas, Kansas Geological Survey Geology Series, No. 1, 7 p., map scale 1:125,000. Wagner, H.C., 1954, Geology of the Fredonia quadrangle, Kansas, U.S. Geological Survey Geologic Quadrangle Map GQ-49, scale 1:62,500. —1961, Geology of the Abbeville quadrangle, Kansas, U.S. Geological Survey Geologic Quadrangle Map GQ-149, scale 1:62,500. |
| Mississippian | MISSOURI | Limestone and minor shale | | |
| Devonian | | Shale | | |
| Ordovician | Lower | Cottler Dolomite Jefferson City Dolomite Roanoke Dolomite ¹ | | |
| | | Arbuckle Group Eminence Dolomite ¹ Potato Dolomite ¹ Derby-Osborn Dolomite ¹ Davis Formation ¹ Bonterre Formation ¹ | | |
| | Upper | Lamotte or Reagan Sandstone ¹ | | |
| Proterozoic | | Granite, rhyolite, metamorphic and sedimentary rocks ¹ | | |

| INDEX TO SOURCES OF GEOLOGIC MAPPING | MISSOURI | KANSAS |
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| 1 | Survey, unpub. mapping, 1986, scale 1:24,000. | 1, 4, W. Whitfield, Missouri Department of Natural Resources, Geological Survey, unpub. mapping, 1984, scale 1:24,000. |
| 2 | 5. C. E. Robertson, Missouri Department of Natural Resources, Geological Survey, unpub. mapping, 1987-89, scale 1:24,000. | 2, D. C. Smith, Missouri Department |