OKLAHOMA GEOLOGICAL SURVEY
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Oklahoma Geologic Quadrangle **OGQ-73**
Geologic Map of the Enid
30´X 60´ Quadrangle

CORRELATION OF MAP UNITS

QUATERNARY — HOLOCENE / PLEISTOCENE: Qal, Qao, Qds, Qcs, Qtg

UNCONFORMITY

PERMIAN — LEONARDIAN / WOLFCAMPIAN: Phy, Pgr, Pwe (Pwef), Psw (Pcgf), Pcg (Pcgp, Pcgc), Pcgf

DESCRIPTION OF UNITS

Qal — ALLUVIUM—Clay, silt, sand, and some gravel composed of locally derived unconsolidated sediment deposited in channels and on flood plains of modern streams

Qao — OLDER ALLUVIUM—Clay, silt, sand, and some gravel composed of locally derived unconsolidated sediment located between 5 to 20 feet above and adjacent to modern flood plains and alluvial valleys.

Qds — DUNE SAND—Generally windblown, fine- to very fine-grained, unconsolidated sand formed into definite dune structure and ridges. Deposits most likely derived from aeolian reworking of modern and older alluvial and terrace deposits, often vegetated except for most recently formed structures.

Qcs — COVER SHEET SAND—Composed of unconsolidated windblown, very-fine grained sand and silt deposited as a featureless plain. Derivation similar to that of dune

Qtg — TERRACE GRAVEL—Unconsolidated gravel, sand, silt, and clay deposited at several levels above and along the former courses of modern rivers and streams.

Phy — HENNESSEY FORMATION—An undistinguishable suite of reddish brown, interbedded silty claystones and mudstones, with local occurrences of argillaceous siltstones and very fine-grained sandstones. Only the lower 350 meters of unit are exposed in the map area.

Pgr — GARBER SANDSTONE—Generally a reddish brown, friable, fine-grained to very fine-grained, trough-cross-bedded, channel sandstone, with local interbeds of mudstone and shale-pebble conglomerate. Mudstone lithology more common in northern part of the map area. Thickness varies from 25 meters in the north to as much as 116 meters in the southern part of the quad.

Pwe — WELLINGTON FORMATION—Mostly multicolored mudstone, mudshale, silty claystone interbedded with very fine- to fine-grained friable sandstones; thin interbeds of gray, argillaceous limestone and dolostone, and gypsum locally in upper half. Shales are commonly concretionary, particularly in the upper third of the unit; this section of the Wellington informally named the Iconium Member (Patterson, 1933). The sandstones normally channel in geometry, but locally may also have tabular geometry, and are more common in the lower half of formation; this section of the Wellington informally named the Fallis Member (Patterson, 1933). The base of Fallis Member, mapped as Pwef, becomes the defacto base of the Wellington Formation proper south of the pinch-out of the Herington Limestone bed at the top of the Chase Group. Thickness of the Wellington varies between 170 to 280 meters.

Psw — STILLWATER FORMATION—Unit predominantly reddish-brown concretionary mudstones, with local interbeds of reddish orange, friable, fine-grained, micaceous channel sandstones; dolomite- and siltstone-pebble conglomerates common at base of sandstone intervals. Top of interval mapped at the base of the Fallis Member of the Wellington Formation, and the base mapped at the top of the Winfield Limestone of the Chase Group. Total thickness varies from 0 to 80 meters.

Pcg — CHASE GROUP—Mostly multicolored calcareous, silty clayshales, claystones and mudstones interlayered with prominent, escarpment forming limestone intervals. Important limestones include in ascending order: the Herington Limestone (Pcgh) of the Nolans Formation, a 1.5 meter thick, thin-bedded, argillaceous, carbonate mudstone, the top of which marks the top of the Chase Group in the northern part of the map area; the 3.5 meter thick Winfield Limestone (Pcgw), consists of 2, thin-bedded, cherty carbonate mudstones to wackestones separated by a thin shale interval, limestone mapped as the top of the Chase Group south of the Herington pinch-out; the Towanda Limestone (Pcgt), a 1 meter thick, planar thin-bedded carbonate mudstone, observed only on the north side of the Arkansas River and Red Creek; the 5 to 8 meter thick Fort Riley Limestone (Pcgf), consisting of 2 prominent algal carbonate mudstones, each approximately 1.5 meters thick separtated by a thin interval of mudstone and very fine-grained sandstone; numerous thin limestones, each no more than 0.5 meters thick may also occur locally as part of the Fort Riley. Overall, only the uppermost 52 meters of the Chase Group is exposed in the map area.

TEXT REFERENCES

Patterson, J.M., 1993, Permian of Logan and Lincoln Counties, Oklahoma: American Association of Petroleum Geologists Bulletin, 17 p., 241-256.

SYMBOLS

- Unit contact; dashed where approximate
- Facies contact; approximately located
- Axial trace of synclinal structure; approximately located; dotted where concealed
- Axial trace of anticlinal structure; approximately located

MAP REFERENCES

1. Fisher, H.C. Jr., 1956, Surface geology of the Bedford area, Osage County, Oklahoma: University of Oklahoma unpublished M.S. thesis, 96 p.
2. Greig, P.B. Jr., 1959, Geology of Pawnee County, Oklahoma: Oklahoma Geological Survey Bulletin, 83, 186 p.
3. Miser, H.D.; and others, 1954, Geologic map of Oklahoma: U.S. Geological Survey and the Oklahoma Geological Survey.
4. Ross, J.S., 1972, Geology of central Payne County, Oklahoma: Oklahoma State University unpublished M.S. thesis, 87 p.
5. Shelton, J.M., Bingham, R.H., and Jenkins, W.A., 1979, Geology and mineral resources of Noble County, Oklahoma: Oklahoma Geological Survey Bulletin, 128, 66 p.

Map of Oklahoma showing the locations of the 30´ X 60´ quadrangles. Red shaded quadrangle represents the current map.

Map Credits

Base map modified from a USGS topographic map of the Enid quadrangle, dated 1990. Universal Transverse Mercator projection. 1927 North American Datum. Geology by Thomas M. Stanley and Galen W. Miller, 2007-2008. Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under 07HQAG0074. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. Cartography and layout prepared by G. Russell Standridge, 2008.

APPROXIMATE MEAN DECLINATION

SCALE 1:100 000

1 0 1 2 3 4 5 6 7 8 MILES
1 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS

CONTOUR INTERVAL 10 METERS

GEOLOGIC MAP OF THE ENID 30′ X 60′ QUADRANGLE, GARFIELD, KINGFISHER, LOGAN, NOBLE, OSAGE, PAWNEE, AND PAYNE COUNTIES, OKLAHOMA

Compiled by Thomas M. Stanley and Galen W. Miller
Cartography by G. Russell Standridge

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