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GEOLOGIC MAP OF THE BRISTOW 30' X 60' QUADRANGLE, CREEK, LINCOLN, OKFUSKEE, OKMULGEE, PAYNE, AND TULSA COUNTIES, OKLAHOMA Thomas M. Stanley 2017



Guymon	Beaver	Buffalo	Alva	Ponca City	Pawhuska	Bartlesville	Neosho	
		Woodward	Fairview	Enid	Keystone Lake	Tulsa	Fayetteville	-36°
		Foss Reservoir	Watonga	Oklahoma City North	Bristow	Muskogee	Stilwell	
		Elk City	Anadarko	Oklahoma City South	Shawnee	Eufaula	Fort Smith	-35°
		Altus	Lawton	Pauls Valley	Ada	McAlester	Mena	
		Vernon		Ardmore	Tishomingo	Antlers	De Queen	
			Wichita Falls	Gainesville	Sherman	Paris	Idabel	
		Map of quadra map	Oklahoma ngles. Rec	a showing I shaded qı	the locatio	ons of the epresents	30' X 60' the current	

SYMBOLS

—• — — Normal fault; dashed where approximate, dotted where concealed; bar and ball on downthrown side ------ Facies contact; approximately located

Qal OLDER ALLUVIUM—Clay, silt, sand, and some gravel composed of locally derived, unconsolidated Qao sediment located between 1.5 to 6 meters above, and adjacent to, modern flood plains and alluvial vallevs. TERRACE SAND—Mostly unconsolidated sand and silt, with little clay- or gravel-sized material. Unit Qts formed at several levels along former courses of present-day rivers and streams. TERRACE GRAVEL—Mostly unconsolidated gravel and sand, with minor silt- and clay-sized material; Qtg deposited well above and at several levels along the former courses of modern rivers and streams. DUNE SAND—Unconsolidated, fine- to very fine-grained sand and silt formed into definite dune structures 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. STILLWATER FORMATION—A series of red to gray mudstones and claystones interbedded with Psw fine-grained, lenticular quartz arenites and very thin, discontinuous beds of fine-crystalline imestones and nodular dolostones. The Stillwater Formation, as named and defined with type section by Patterson (1933), takes stratigraphic preference over nearly the same lithologic interval named as the Oscar Group by Shelton and others (1985). As per Patterson (1933), the top of the Stillwater Formation is defined as the base of the Fallis Member of the Wellington Formation. The base of the Stillwater is locally variable and dependent on when various marker limestones of the Chase and Council Grove Groups begin to pinch out to the south. Consequently, in the far northern part of the sheet, the base of the Stillwater is first represented by the top of the Cottonwood Limestone. Subsequent to the Cottonwood pinch-out just north of the Cimarron River, the base of the formation becomes fixed at the top of the Red Eagle Limestone. On the Bristow sheet, only the basal 150 to 170 meters of the Stillwater Formation occur. CHASE GROUP—In the current map area, the Chase Group is represented only by the Fort Riley Member (Pcgf) of the Barneston Limestone and probably the lower part of the Doyle Shale. The Fort Riley is a very thin (less than 1/2 meter thick) light gray, fine-crystalline, dolomitic limestone. The top of the Chase Group is represented by the top of the Winfield Limestone, which crops out further to the west of this sheet. The group pinches out just north of the Cimarron River where it interfingers with lithologic elements of the Stillwater Formation. Only the basal 8 meters of the Chase Group is present. COUNCIL GROVE GROUP—The group is near complete along the northern border of the quad, being comprised of, in descending order: the Beattie Formation, Eskridge Shale, Grenola Formation, Roca Shale, Red Eagle Formation, Johnson Shale, and the Foraker Formation at base. Only the more prominent limestone members are shown. Both the Cottonwood Limestone (PPcgc) of the Beattie Formation and the Neva Limestone (PPcgn) of the Grenola Formation pinch out into the Stillwater Formation near the Cimarron River. The remaining, prominant limestones include, 1) the Red Eagle Formation (PPcgr), which is a prominant, 1 to 2 meter thick, gray to light gray fossiliferous carbonate mudstone that may weather to a distinct red color. The limestone also constitutes the boundary between the Permian and Pennsylvanian Periods in Oklahoma; 2) the Long Creek Limestone (PPcgl), which represents the upper member of the Foraker Formation, is ~3.5 to 5 meters thick, thin- to medium-bedded skeletal wackestone to carbonate mudstone; and 3) the Americus Limestone, which represents the lower member of the Foraker Formation, as well as the base of the Council Grove Group. It is usually less than a meter thick, consisting of a gray, fine-crystalline dolomitc limestone. The Americus pinches out into the Vanoss Formation about 11 km north of Stroud, and all elements of the Council Grove Group pinch out near the town of Davenport.

Total thickness of the Council Grove Group varies from 0 to no more than 120 meters. Total thickness of the Vanoss Formation ~70 meters.

Total thickness varies between 0 and 16 meters.

Oklahoma Geologic Quadrangle OGQ-94 Geologic Man of the Bristow 30' X 60' Quadrangle



(i.e., from north to south), as well as vertically. The horizontal component exemplifies the stratigraphic changes that occur when the more marine-dominated units originating in Kansas begin to interfinger and pinch out into the more terrestrial-dominated sediments

DESCRIPTION OF UNITS

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

Pvn VANOSS FORMATION—Mostly muticolored mudstones and mudshales interbedded with lenticular, ine-grained, argillaceous quartz arenites. Minor red to reddish-brown claystones occur in the middle of the unit. The sandstones in the lower half of the formation become slightly arkosic in the southern part of the sheet. Limestone-clast conglomerates are rare and show a similar distribution as the arkoses. The top the formation is placed at the base of the Red Eagle Limestone, whereas the base of the formation is placed at the top of the Reading Limestone once most lithostratigraphic elements of the Council Grove, Admire, and Wabaunsee Groups pinch out to the south.

ADMIRE FORMATION—Composed of undifferentiated red and gray shales, fine-grained Pag sandstones, and undistinguishable thin, fossiliferous limestones. Unit bounded at top by the base of the Americus Limestone of the Council Grove Group, and the base occurs at the top of the Brownsville Limestone of the Wabaunsee Group. The Admire pinches out into the Vanoss Formation approximately 11 km north of Stroud.

 Pwg
 WABAUNSEE GROUP—Overall, the general lithologic character of the group consists of massive limestones interbedded with calcareous, argillaceous, and arenaceous shales. Stratigraphically, the
group is comprised of six limestone and six shale members, which are, in descending order: the Wood Siding Formation at top, Emporia Limestone, Auburn Shale, Bern Limestone, Šcranton Shale, Howard Limestone, and the Severy Shale at base. Only the more prominent limestone members are shown and include, in descending order: 1) the Brownsville Limestone at the top of the Wood Siding Formation, which constitutes the top of the Wabaunsee Group. It is ~1 meter thick along the quad's northern boundary, consisting of a fine- to medium-crystalline dolomitic limestone. It pinches out into the Vanoss Formation about 11 km north of Stroud; 2) the Grayhorse Limestone (Pwgg) in the middle of the Wood Siding is a 1 to 2 meter thick unit consisting of two light gray limestone beds separated by a greenish-gray shale. The lower limestone bed is fossiliferous, with many of the fossils being replaced with calcite. The upper limestone bed is well-indurated, distinctly iron-stained, and sparsely fossiliferous. The Grayhorse temporarily becomes the top of the Wabaunsee Group south of the termination of the Brownsville Limestone; 3) the Elmont Limestone (Pwge) at the top of the Emporia Limestone is 3 meters thick and consists of two limestone beds separated by a gray shale. The lower bed weathers light gray and distinctly contains abundant fusulinids. The upper bed is brown weathering, irregularly-bedded, and contains a more diverse fossil fauna; 4) the Reading Limestone (Pwgr), located at the base of the Emporia, is 6 meters thick, consisting of four limestone beds separated by thin intervals of gray shale. The lower and upper limestones are algal pellet limestones with irregular upper surfaces. They are locally fossiliferous, with pelecypod fragments. The middle two limestones are gray to dark gray weathering, dense, brittle, and fossiliferous. The upper-middle limestone contains fusulinids, algal pellets, horn corals, and gastropods locally. The shale between the lower and lower-middle limestones may contain an unnamed, thin coal bed with associated underclay; 5) the Wakarusa Limestone (Pwk) at the top of the Bern Limestone represents the base of the Wabaunsee Group throughout most of this sheet and consists of a 0.5 to 1.5 meter thick, dense, dark gray to blue gray weathering fossiliferous mudstone. Fossils may

> Ada Formation just east of Arlington, Oklahoma. Total thickness of the Wabaunsee Group varies between 40 and 80 meters.

include fusulinids, brachiopods, and bryozoan fragments. Closer to the southern part of the sheet, the Wakarusa grades into a light gray, fine-crystaline dolomitic limestone before pinching out into the

	Geologic Map of the Bristow 30 X 60 Quadrangie
Pad	ADA FORMATION—Interbedded brown to gray weathering shales; lenticular, fine-grained quartz arenites with local cross-bedding; and thin limestones. Chert-pebble conglomerates at the base of some sandstone beds common in the southern half of sheet. Important limestones include: 1) the Church Limestone (Pch) in the middle of the Howard Limestone, which corresponds to the Bird Creek Limestone of Oklahoma in older reports. The Church quickly pinches out approximately 9.5 km due east of Cushing, Oklahoma; 2) the Turkey Run Limestone (Ptr), which corresponds with the Coal Creek Member of the Topeka Limestone of Kansas, is 0.3 to 0.6 meters thick, dark gray, thin-, to occasionally medium-bedded, skeletal wackestone; and 3) the Beil Limestone (Pbl), which defines the base of the Ada and is a prominant 2.2 to 4 meters thick, thin-bedded, skeletal wackestone to carbonate mudstone.
	Interbedded shales and sandstone sequences occurring between the top of the Turkey Run Limestone and the base of the Beil Limestone belong to the Pawhuska Formation of Oklahoma usage.
	Total thickness of the Ada Formation varies between 16 and 60 meters.
₽vm	weathering shale, siltstone, fine- to coarse-grained sandstone, and local, thin limestones. Chert- pebble conglomerates common in the lower half of formation; the prominant (10 meter thick) Boley Conglomerate occurs at the base of the formation in lower third of map area. In the northern half of map where basal conglomerate is absent, the Cheshewalla Sandstone, which is a moderately indurated, 2 to 6 meters thick, fine-grained, cross-bedded, argillaceous quartz arenite, marks the base of the Vamoosa Formation. The Cheshewalla roughly correlates with the Tonganoxie Sandstone of Kansas. Total thickness ~120 meters.
₽tI	TALLANT FORMATION—Consists mostly of greenish-gray and grayish-blue weathering mudstone interbedded with local thin, lenticular sandstones. Sandstones poorly exposed except for the Bigheart Sandstone, a 6 meter thick, red to reddish-brown, friable, fine-grained quartz arenite that marks the base of the Tallant Formation. The formation is truncated by the overlying Boley Conglomerate of the Vamoosa Formation about 8 km north of Boley, Oklahoma. Thickness ranges from 0 to 50 meters.
Pbn	BARNSDALL FORMATION—Comprised of two alternating intervals of reddish-brown to blue-gray weathering mudstones (first shale interval begins at top of formation) and two intervals of light brown to red weathering, thin-bedded, poorly indurated, argillaceous, fine-grained quartz arenites. Sandstone interval at base of formation, called the Okesa Member, is thicker (6 meters thick on average) than the middle sandstone interval (averages 1.5 meters thick) and is more indurated. Most likely, the uppermost 10 to 15 meters of formation have been removed by pre-Virgilian erosion in the area of Boley, Oklahoma. Total thickness of formation varies between 15 to 50 meters; overall, formation thins to the south.
Pwn	WANN FORMATION—Consists of interbedded red to reddish-brown weathering mudstones and thin- to medium-bedded, argillaceous, fine- to medium-grained quartz arenites. Sandstones may have numerous horizontal burrows locally. Formation thins considerable to the south until it is truncated by the Barnsdall Formation just north of Little Deep Fork Creek. Thickness of formation ranges from 0 to 40 meters.
Pia	IOLA FORMATION—Poorly exposed in map area. Where observed, it is represented by tan to medium gray weathering, upper and lower sandy limestone beds that are separated by an interval of interbedded calcareous sandstone and shale. As with the Wann Formation, the Iola is probably truncated by post-Wann, pre-Barnsdall erosion just north of Little Deep Fork Creek, although some geologists (Oakes, 1959) have extended the Iola Formation, represented as a calcareous sandstone interval, as far south as Deep Fork Creek. Thickness varies between 3 and 10 meters, with thicker parts of section found exclusively along the northern boundary of the sheet.
Pch	CHANUTE FORMATION—Mostly a grayish-orange to pale yellowish-brown weathering, laminated to blocky bedded, weakly calcareous, very silty clayshale to mudshale. Shale tends to be more sandy in the lower half of unit. Locally, a 2.5 to 3 meter thick, indurated, laminated to thin-bedded, fine to very fine-grained quartz arenite (which may correlate to the Cottage Grove Sandstone) occurs near the top of the formation. Another prominent, yet unnamed, sandstone occurs at the base of the formation. Total thickness ~20 meters.
Pdw	DEWEY FORMATION—In some locations composed of two sandy limestones or limey sandstone beds with an intervening calcareous shale interval. In other locals, specifically in the southern half of map area, the Dewey is composed of an upper, calcareous clayshale, and a lower, indurated, 1.5 to 6 meter thick very calcareous, fine-grained quartz arenite. Thickness of the Dewey varies between 10 to 23 meters thick.
Pnb	NELLIE BLY FORMATION—Consists mostly of clayshale and mudstone interbedded with some prominent sandstones, none of which can be easily separated into mappable units due to their indefinite upper and lower contacts. Sandstones typically indurated to moderately indurated, fine- to medium bedded, fine-grained quartz arenites that vary in thickness between 6 and 25 meters. Thickness of shale intervals at least half to a quarter of that observed for the sandstone intervals Total thickness of formation ~65 meters.
Phs —	HOGSHOOTER FORMATION—Fairly massive, red to reddish-brown weathering, whole fossi mudstone to skeletal wackestone. A weak, thin bedding texture becomes more prominent in the southern third of the map area as the limestone becomes more argillaceous in texture. Thickness of formation no more than 1.5 meters at most exposures.
Pcv	COFFEYVILLE FORMATION—Gray to light brown weathering, well-laminated to fissile, slightly silty clayshale, interbedded with thinner intervals of brown to yellow-brown weathering, indurated, fine-to very fine-grained, slightly silty, quartz arenites. Sandstones typically cap prominant cuestas above steep shale escarpments. Shale intervals are said to be locally fossiliferous (Ries, 1954), although none were observed by present geologist. Total thickness of unit ~50 meters.
₽cb —	CHECKERBOARD LIMESTONE—Medium gray when fresh, but weathers to a distinct dark yellowish orange color. Texturally, it is a massive, skeletal to whole-fossil carbonate mudstone to wackestone. Thickness 1 to 1.5 meters.
Psm	SEMINOLE FORMATION—Consists of a lower sandstone interval called the Tulsa Sandstone, and ar upper suite of interbedded, laminated, concretionary, silty clayshales, mudshales, and siltstones. The Tulsa Sandstone is a ~20 meter thick, yellowish-brown, fine- to medium-grained (locally coarse grained) quartz arenite that is frequently conglomeratic in texture, particularly in the southern map area. Thickness of the Seminole Formation ~25 meters.
Plo	LOST BRANCH FORMATION—Poorly exposed, except for the Glenpool Limestone. Overall, a light brown weathering, laminated, slightly calcareous, micaceous, silty clayshale. Basal 3 ft of formation just above the Dawson Coal, consists of a medium dark gray, well-laminated to fissile, phosphatic mudshale to clayshale called the Nuyaka Creek shale bed. The top of the formation is marked at the top the Glenpool Limestone. Total thickness ~12 meters.
Pmm	MEMORIAL FORMATION—The top of the formation is represented by the Dawson Coal. The base occurs at the base of the Eleventh Street Limestone, which roughly correlates to the lower limestone member of the Lenepah Limestone (Heckel, 1991). Just south of the northern map boundary, the Eleventh Street Limestone pinches out, and as such, the remaining lithologic elements of the Memoria and Lost Branch Formations are folded into the Holdenville Group. Mostly, the Memorial Formation consists of interbedded sandy, weakly calcareous mudstones and a friable, fine-grained sandstone (Jenks Sandstone) that occurs in the middle of the formation. Only the upper 20 meters of the Memorial Formation is exposed in the quad.
Phg	HOLDENVILLE GROUP—Contains some lithostratigraphic elements of the Lost Branch and Memorial Formations, most notably the Nuyaka Creek Shale of the Lost Branch Formation and the Dawson coal of the Memorial Formation. In the Bristow sheet, the Holdenville is primarily a grayish green to yellow brown weathering, locally fossiliferous, slightly silty claystone to clayshale interbedded with thir intervals of fine- to very fine-grained quartz arenite and thin beds of whole fossil carbonate mudstone Shale intervals tend to thicken toward the south; conversely, the sandstone intervals thin to the south and become more prevalent in middle of the formation. Thickness varies between 15 and 55 meters.
Pww	WEWOKA FORMATION—Consists of alternating intervals of shale and sandstone in approximate equal numbers (though shale becomes more dominant toward the southern half of map area) Sandstones tend to be weakly indurated, yellowish-brown to reddish-brown weathering, fine-grained argillaceous quartz arenites. A prominent sandstone interval forming distinct cuestas and escarpments (compared to the flat featureless planes formed on the Holdenville) occurs at the top of the formation and is correlatable to the Jenks Sandstone of the Memorial Formation to the north. Shales are slightly calcareous clavshales and mudshales that are highly fossiliferous locally.

Total thickness ~95 meters. WETUMKA SHALE—Only occurs in the far southeast corner of the quad and is poorly exposed. Mainly Pwt composed of grayish-yellow to yellow-brown weathering, slightly silty clayshale; very thin beds of ^I friable, argilaceous quartz arenite occur locally in the middle and base of unit. Thickness no more than 15 meters.

CALVIN SANDSTONE—Regionally, composed of three informal members, but only the upper sandstone member is exposed in mapping area. Here, the sandstone is a brown weathering, moderate o weakly indurated, fine-grained quartz arenite. Only the upper 7 meters exposed on sheet.

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