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GEOLOGIC MAP OF THE LAWTON 30' X 60' QUADRANGLE, CADDO, COMANCHE, GRADY, KIOWA, STEPHENS, AND TILLMAN COUNTIES, OKLAHOMA Compiled by Thomas M. Stanley and Galen W. Miller Cartography by G. Russell Standridge

SCALE 1:100 000

1 0 1 2 3 4 5 6 7 8 MILES

CONTOUR INTERVAL 10 METERS

APPROXIMATE MEAN DECLINATION

10 KILOMETERS

2005



03° 1	02°	101°	100°	99°	98° 9	97° 9	6° 9	5°	
Boise City	Guymon	Beaver	Buffalo	Alva	Ponca City	Pawhuska	Bartlesville	Neosho	
			Woodwar	rd Fairview	Enid	Keystone Lake	Tulsa	Fayetteville	a 3(
			Foss Reservoi	ir Watonga	A Oklahoma City North	Bristow	Muskogee	Stillvell	
			Elk City	Anadarko	Oklahoma City South	Shawnee	Eufaula	Fort Smit	.h
			Altus	Lawton	Pauls Valley	Ada	McAlester	Mena	
			Vernon	Burkburne	Ardmore	Tishomingo	Antlers	De Quee	'n
				Wichita Fa	alls Gainesville	Sherman	Paris	Idabe	I
			Map quad map	of Oklaho Irangles. R	ma showing ed shaded o	the location the location of t	ons of the represents	30' X 6 the curre	0' nt



SYMBOLS

— Unit contact; approximately located

Axial trace of synclinal structure, dashed where approximate Axial trace of anticlinal structure, dashed where approximate Fault, dotted where covered; ball and spike on downthrown side. All faults are normal faults, dipping 60–65° Strike and dip of bedding



Qds

Phy

Oklahoma Geologic Quadrangle OGQ-63 Geologic Map of the Lawton 30'X 60' Quadrangle



DESCRIPTION OF UNITS

- ALLUVIUM—Unconsolidated sand, silt, clay, and gravel in stream and river Qal channels on modern flood plains OLDER ALLUVIUM—Unconsolidated sand, silt, clay, and gravel in stream and Qao river channels, mainly between 0–12 m above modern flood plains DUNE SAND—Unconsolidated windblown sand formed into definite dune
 - structures and ridges COVER SHEET SAND—Featureless sheet of windblown silt and sand

 - TALUS DEPOSIT—Unconsolidated debris of angular gravel and sand derived from the weathering of outliers of the Wichita Granite Group, forming immature alluvial fans and pediment surfaces

UNCONFORMITY

- CLOUD CHIEF FORMATION—In this quad represented by the Moccasin Creek gypsum bed; a white, massive bed of gypsum that varies from 9-13 meters
- RUSH SPRINGS FORMATION—Reddish-brown locally orange-brown, cross-bedded, fine- to very fine-grained sandstone. The Weatherford Gypsum (Prw) is a prominant 1-2 meter thick bed occurring 9-18 meters below top of unit. Formation thickness varies between 60-90 meters.
- MARLOW FORMATION—Orangish-brown, fine-grained, massive sandstone with local interbeds of siltstone and silty shale. The Relay Creek dolomite bed locally occurs about 6 meters below top of formation. Top mapped at the top of the Emanuel Gypsum Bed. Thickness varies from 30 to 40 meters
- EL RENO GROUP, Undifferentiated—Reddish-brown silty shale, with local interbeds of thin dolomite bed. Blaine Formation does not occur in this area. Interval between 120 and 180 meters thick.
- DUNCAN SANDSTONE—Light-gray to reddish-brown, fine-grained, cross-bedded sandstone, with interbeds of yellowish gray and reddish-brown shale, and local occurrences of mudstone conglomerate. Thickness between 15 to 60 meters.
- HENNESSEY FORMATION—Reddish-brown shale, with local reddish-brown to greenish-gray siltstone, and tan sandstone beds. Unit varies from 100–160 meters thick.

	Pwr	WAGGONER RANCH FORMATION—Interbedded reddish-brown laminated silty mudstones and thin limestone and dolomite beds; locally, thin intervals of siltstone and sandstone occur, but are rare. Limestone and dolomite beds typically medium to coarsely crystalline texture, particularly in upper half of formation; where original depositional texture is observed, carbonates consist of an argillaceous, algal lime mudstone. The Lake Kemp Limestone, a 2-3 meter thick coarsely crystalline limestone, occurs at the top of the formation; base mapped at the top of the stratigraphically highest occurring sandstone or conglomerate bed of the Petrolia Formation. Thickness about 50 meters.
	Ppt	PETROLIA FORMATION—Interbedded reddish-brown, unstratified silty mudstones, and lenticular, trough cross-bedded, medium- to fine-grained sandstones, soft sediment deformation common; locally, conglomeratic beds consisting of siltstone and limestone clasts set within a medium- to coarse-grain matrix occur, particularly in the upper half of the formation. Mudstones are blocky bedded, with local occurrences of calcareous nodules and paleosol development. Thickness varies between 70-100 meters.
	Ppo	POST OAK FORMATION—Generally unconsolidated to weakly consolidated unit, consisting of well-rounded cobbles, sand, silt, and clay. Lithology of cobbles reflects the provence of bedrock terraine from which the formation was derived, either limestone, granitic, or anorthositic. Post Oak derived from more mafic provences locally contains zeolite-opal, termed Teepee Creek facies. Laterally, the Post Oak interfingers with the Hennessey and Garber Formations. Surficial thickness from 0 to as much as 150 meters; however, in subsurface, formation extends into Pennsylvanian rocks occurring at depths of 700 meters.
	UNCONF	ORMITY
	Ovs	VIOLA SPRINGS FORMATION—Dark gray, weathers yellow brown, dense, thin-bedded micritic limestone. Only small outliers of the Viola, occurring with the underlying Bromide Formation are exposed in northwest quarter of map area. Exposed thickness about 120 meters; top not exposed.
Ē	UNCONF	FORMITY
GROL	Obr	BROMIDE FORMATION—Yellowish-brown to tan, wavy-, thin-bedded, moderately argillaceous, fossiliferous limestone. Exposed thickness 75-85 meters; base not exposed.
	Ows	WEST SPRING CREEK FORMATION—Medium gray carbonate mudstones and intraclastic limestones. Base of formation locally contains an appreciable amount of quartz sand detritus. Thickness about 90 meters; top not exposed.
	Oki	KINDBLADE FORMATION—Medium gray carbonate mudstones and intraclastic limestones. Formation usually more locally dolomitized, and contains less quartz detritus than overlying West Spring Creek. Base of formation poorly bedded due to abundant algal boundstones. Thickness about 450 meters.
RBUCKLE GROUP	Occ	COOL CREEK FORMATION—Highly variable mixture of medium gray carbonate mudstones, intraclastic limestones, algal stromatolitic boundstones, oolitic limestones, and pure quartz sandstones. Base of the formation mapped at the base of a prominant quartz sandstone called the Thatcher Creek Member. Thickness about 300 meters.
	Omh	McKENZIE HILL FORMATION—Medium gray carbonate mudstones and intraclastic limestones. Abundant chert in upper half of formation, minor glauconite in lower half. Basal contact with Signal Mountain Formation ambiguous. Thickness about 240 meters.
A	€Osm	SIGNAL MOUNTAIN FORMATION—Dark gray, distinctly thin-bedded at base, but becoming thicker bedded toward top, highly fossiliferous mixture of interbedded carbonate mudstones, wackestones, grainstones, and intraclastic limestones. Thickness about 200 meters.
	-Efs	FORT SILL FORMATION—Light gray, thick-bedded to massive carbonate mudstones; thin-bedded, dolomitic siltstones common in middle third of formation, while algal boundstones are common in upper third. A conspicuous coarsely crystalline dolomite (the Bally dolomite) locally occurs near top of unit.
		ARBUCKLE GROUP, undifferentated—Occurring as isolated blocks on the Fort Sill Reservation, north of Lawton.
0	€hc	GREEK FORMATION—Medium gray, cross-bedded, skeletal grainstones; locally, a 12 meter thick interval of calcareous, quartz-rich sandstone occus in middle of formation. Thickness from 0-60 meters, variable due to the irregular unconformable surface with the Carlton Rhyolite.
GROU	£rs	REAGAN SANDSTONE—Tan to brown, cross-bedded, glauconitic, sandstone. Due to the irregular unconformable surface with the Carlton Rhyolite, thickness of unit varies from 0-45 meters.
	1739	TIMBERED HILLS GROUP, undifferentated—Occurring as isolated blocks on the Fort Sill Reservation, north of Lawton.
	UNCONF	ORMITY
	_	diabase dikes—Various dark to medium gray, to dark green aphanitic mafic rock; usually exhibits strong hydrothermal alteration. Dikes range from 0.5 to 1 meter wide, and may extend for several kilometers.
	f	felsic dikes—Various light colored, aphanitic, fine-crystalline, to sometimes medium-crystalline rocks of granitic composition. Most are only a few centimeters wide, and extend for only a few 100 meters.
	÷€cs	COLD SPRINGS BRECCIA—Dark gray microdiorite blocks set in matrix of leucogranite; locally medium gray quartz monzodiorite blocks in light gray granodiorite matrix.
	€qg	QUANAH GRANITE—Light colored, medium-crystalline, granophyric. Biotite most dominant ferromagnesian mineral to the exclusion of hornblende.
Ĵ.	-€lg	LUGERT GRANITE—Reddish-pink to reddish-brown, medium-grained granite. Feldspar crystals typically twice as large as quartz; hornblende more common than biotite.
o (In Par	÷Ccg	CACHE GRANITE—Light colored, granophyric microporphyry; grain size less than 1-2 millimeters. Magnetite present.
GROUF	€ср	COOPERTON GRANITE—Light colored, granophyric microporphyry. Biotite the more dominant ferromagnesian mineral.
RANITE	-Emg	granophyric microporphyry; grain size less than 1-2 millimeters. Magnetite common, pyroxene locally.
MICHITA GF	-€Im -€sm	LONG MOUNTAIN GRANITE—Light colored, highly granophyric microporphyry with hornblende as dominant ferromagnsium mineral. SADDLE MOUNTAIN GRANITE—Gradational from spherulitic-porphyritic to granophyric-porphyritic. Hornblende and biotite in equal amounts.
	esg	MOUNT SCOTT GRANITE—Variably granophyric porphyry with ovoid feldspar crystals; hornblende dominant ferromagnesian mineral.
	- C rl - C cr	RUSH LAKE GRANITE—Pink to brick red, seriate, variable granophyric granite with connected quartz. CARLTON RHYOLITE GROUP, undifferentiated—Rhyolite lavas interbedded with minor tuffs and agglomerates; includes the Bally Mountain, Blue Creek Canyon, and Fort Sill rhyolites
	Ædm	DAVIDSON METARHYOLITE—Banded buff to brown colored quartz, feldspar and white mica metarhyolite; pink to buff, highly fractured, commonly veined feldspathic metarhyolite
	-Emb	MOUNT BAKER GABBRO—Medium- to fine-crystalline, hornblende-biotite (hornblende dominant), 2 pyroxene, no olivine gabbro.
0	€gc	GLEN CREEK GABBRO—Medium-crystalline, biotite-amphiobole, olivine gabbro.
GROUF	€sc	SANDY CREEK GABBRO—Medium-crystalline, biotite-amphiobole gabbro, with minor olivine.
BBRO	-Ems	MOUNT SHERIDAN GABBRO—Medium-crystalline, biotite gabbro; locally fractionated to ferrogranodiorite.
GA	€gb	ROOSEVELT GABBRO, undifferentiated—Small, isolated intrusions of dark gray to black, medium-crystalline gabbro with biotite and amphiobole. Unit shows some affinities to the Sandy Creek Gabbro.
	÷Ggm	GLEN MOUNTAINS LAYERED COMPLEX—Medium to light gray, medium- to sometimes coarse-crystalline; at least 5 distinctly layered zones containing variable amounts of plagioclase, augite, and olivine yielding anorthosite, anorthositic gabbro, and troctolite (see Powell and others, 1980).

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