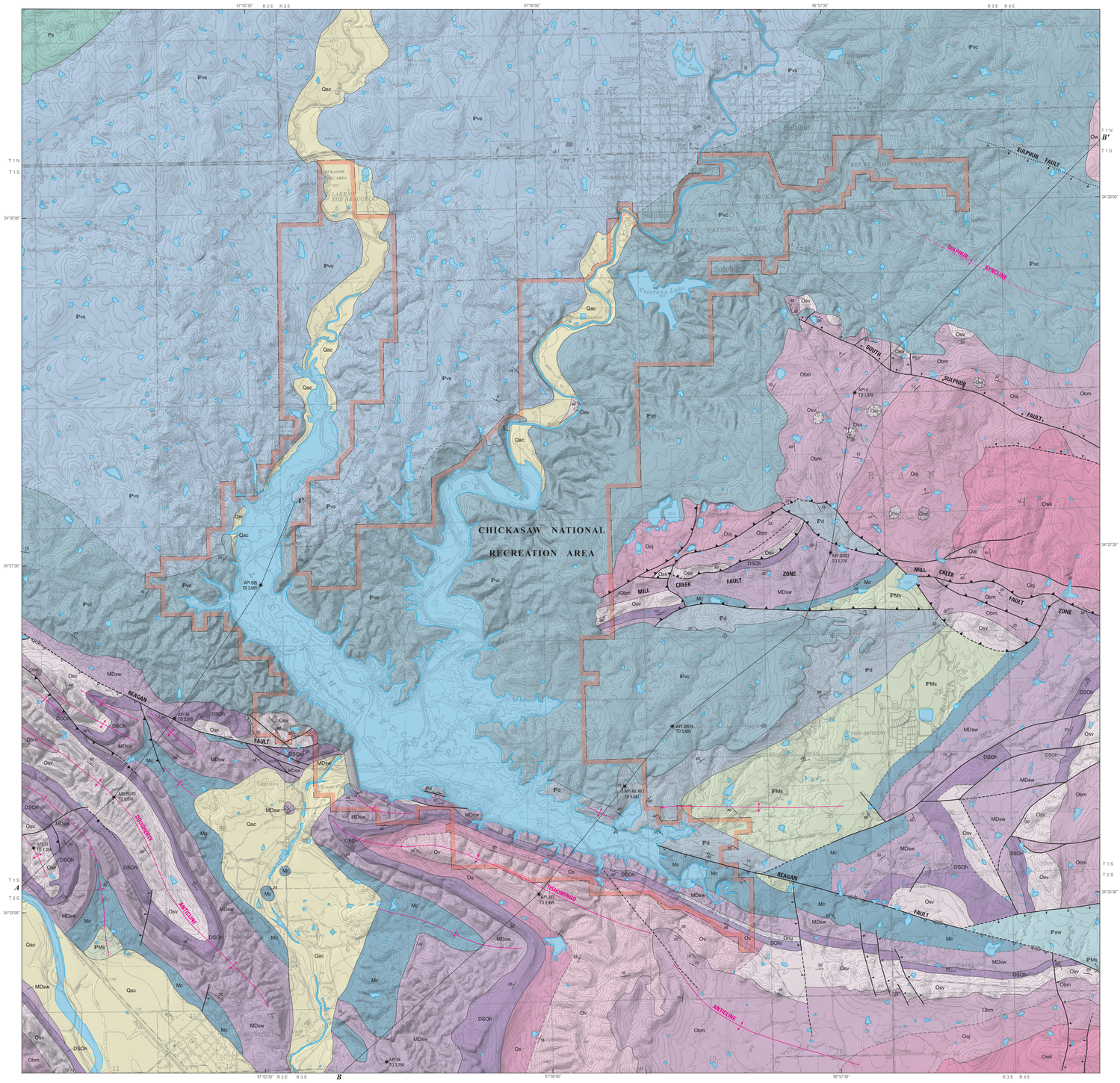
science for a changing world

U.S. Department of the Interior
U.S. Geological Survey

Prepared in cooperation with the
National Park Service

Scientific Investigations Map 3258
Pamphlet accompanies map



Base from 1:24,000 U.S. Geological Survey Davis, OK, 1965, rev. 1993; Sulphur North, OK, 1967, rev. 1993; Dougherty, OK, 1965, rev. 1978; and Sulphur South, OK, 1963, rev. 1978

Projection: Universal Transverse Mercator, zone 14
North American Datum of 1983 (NAD 83)
Datum and Geodetic Reference System 80 (GRS 80) spheroid

Shaded relief from U.S. Geological Survey National Elevation Dataset (NED, *http://nationalmap.gov/elevation.html*)

Chickasaw National Recreation Area boundary from the National Park Service, 2012

There may be private inholdings within the boundaries of National or State reservations shown on this map

Not all boundaries may have been placed on the map owing to limitations of scale and complexity of land ownership and status

APPROXIMATE MEAN DECLINATION, 2010

SCALE 1:24 000

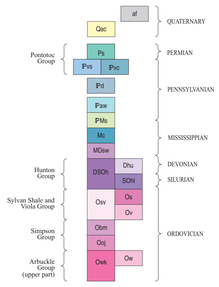
1 1/2 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

OKLAHOMA
MAP LOCATION

Original geologic compilation by William E. Ham, Myron E. McKinley, and others, 1954, Oklahoma Geological Survey. Revised by Johnson, 1990, Oklahoma Geological Survey
Field work done in 2009 and 2010 by Charles D. Blome, David J. Lidke, and Ronald R. Wahl
D. Paco Van Sistine prepared the digital compilation of the geologic map and the GIS database
Digital topographic base prepared by Theodore R. Brandt
Edit and cartographic layout by L.J. Binder
Denver Science Publishing Network

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

[Note: Due to the addition of a shaded relief base, colors on the List of Map Units and the Correlation of Map Units may not exactly match unit colors on the map. More detailed descriptions of these units are available in the accompanying pamphlet]

QUATERNARY STRATIGRAPHY

af — **Artificial fill (Quaternary)**

Qac — **Alluvium and colluvium, undifferentiated (Quaternary)**

PALEOZOIC STRATIGRAPHY

Pontotoc Group (Lower Permian and Upper Pennsylvanian)

Ps — **Stratford Formation (Lower Permian)**

Vanoss Formation (Upper Pennsylvanian, Virgilian)

IPvs — **Upper shale facies**

IPvc — **Lower limestone conglomerate facies**

IPd — **Deese Group, undifferentiated (Middle Pennsylvanian, Middle Desmoinesian)**

IPaw — **Atoka and Wapanucka Formations, undifferentiated (Middle to Lower Pennsylvanian)**

Atoka Formation (Middle Pennsylvanian, Atokan)

Wapanucka (Middle to Lower Pennsylvanian, Atokan to Morrowan)

IPMs — **Springer Formation (Lower Pennsylvanian to Upper Mississippian, Morrowan to Chesterian)**

Mc — **Caney Shale (Upper to Middle Mississippian, Chesterian to Meramecian)**

MDsw — **Sycamore Limestone, Welden Limestone, and Woodford Shale, undifferentiated (Mississippian to Devonian)**

Sycamore Limestone (Middle to Lower Mississippian, Meramecian to Kinderhookian)

Welden Limestone (Lower Mississippian)

Woodford Shale (Lower Mississippian, Kinderhookian to Upper Devonian)

DSOh — **Hunton Group, undifferentiated (Lower Devonian to Upper Ordovician, Cincinnatian)**

Dhu — **Upper part of Hunton Group, undifferentiated (Lower Devonian)**

Bois d'Arc Formation

Haragan Formation

SOH — **Lower part of Hunton Group, undifferentiated (Silurian to Upper Ordovician)**

Henryhouse Formation (Silurian)

Clarita Formation (Silurian)

Cochrane Formation (Silurian)

Keel Formation (Upper Ordovician, Cincinnatian)

Osv — **Sylvan Shale and Viola Group, undifferentiated (Upper Ordovician, Cincinnatian)**

Os — **Sylvan Shale**

Ov — **Viola Group**

Simpson Group (Middle Ordovician)

Obm — **Bromide, Tulip Creek, and McLish Formations, undifferentiated**

Bromide Formation

Tulip Creek Formation

McLish Formation

Ooj — **Oil Creek and Joins Formations, undifferentiated**

Oil Creek Formation

Joins Formation

Arbuckle Group (Lower Ordovician to Upper Cambrian)

Owk — **West Spring Creek and Kindblade Formations, undifferentiated (Lower Ordovician)**

Ow — **West Spring Creek Formation**

Kindblade Formation

EXPLANATION

Contact—Dashed where inferred. In cross sections and structure map, contacts that are also major unconformities are labeled; **WU**, Wichita unconformity; **AU**, Arbuckle unconformity (see Regional Structural Framework in pamphlet for discussion)

Internal map-unit boundary—Separates locally subdivided map units from a more commonly mapped, undifferentiated unit that comprises the subdivided map units. Boundary is a cartographic feature that marks the location where the mapping of the subdivided map units ceased, mostly due to poor exposure

Fault—Dashed where inferred

Normal fault—Dashed where inferred, dotted where concealed; bar and ball on downthrown block. In cross sections, arrows show relative direction of displacement

Thrust fault—Dashed where inferred; sawteeth on upthrown block. In cross sections, arrows show relative direction of displacement

Oblique-slip fault—Dashed where inferred; open sawteeth on up-thrown block (reverse/thrust offset). Arrows show direction of apparent lateral displacement (right-lateral offset). In cross sections, arrows show relative direction of displacement in plane of cross section. **T** indicates movement towards observer (perpendicular to plane of cross section), **A** indicates movement away from observer

Anticline—Showing trace of axial surface, and dip direction of limbs

Syncline—Showing trace of axial surface, and dip direction of limbs; dotted where concealed

Strike and dip of bedding

60 — **Inclined**

Overturned

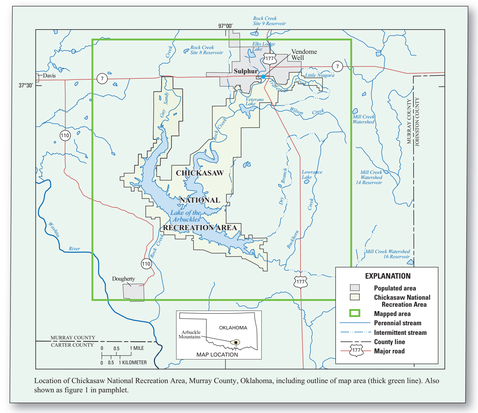
Horizontal

Area of collapsed and mega-brecciated strata—Hachures point towards ancient down-dropped core. Preserved and expressed geomorphically as a small hill with a circular perimeter (see pamphlet for discussion)

Reservoir, lake, pond, or river

API no. 182
TD 2,495 — **Drill hole**—Used to constrain cross sections. Abbreviated American Petroleum Information number (API) is shown on map and cross sections with total depth of well (TD) from surface elevation

Chickasaw National Recreation Area boundary



Location of Chickasaw National Recreation Area, Murray County, Oklahoma, including outline of map area (thick green line). Also shown as figure 1 in pamphlet.



Circular-shaped hill east of map area, in eastern part of the Hunton anticline (figs. 2 and 3 in pamphlet). Similar hills occur in the east-central part of the map area and are interpreted to be erosional remnants of paleo-karst sinkholes (see pamphlet for discussion).



Steeply dipping shale of Woodford Shale (**MDsw**) exposed along southern shoreline of Lake of the Arbuckles, directly south of Reagan fault (looking south from boat).

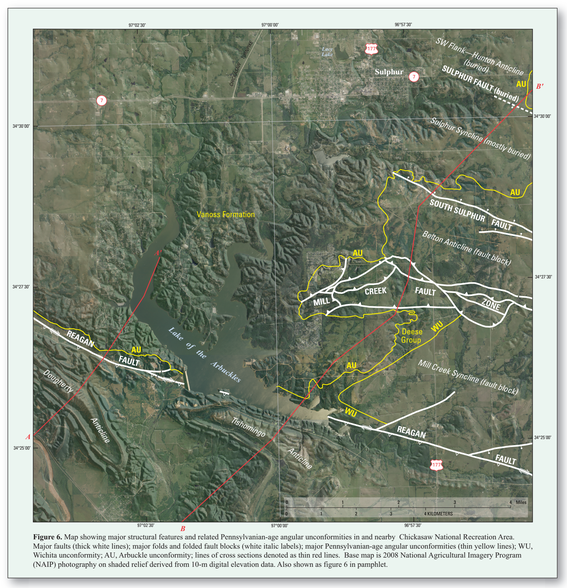
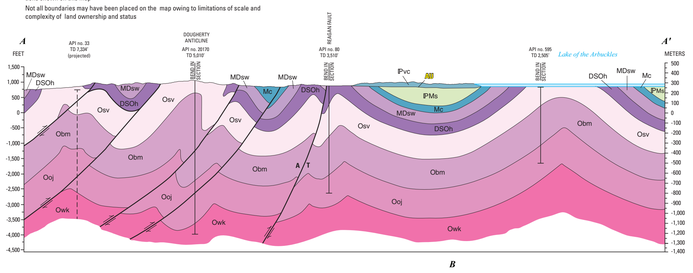
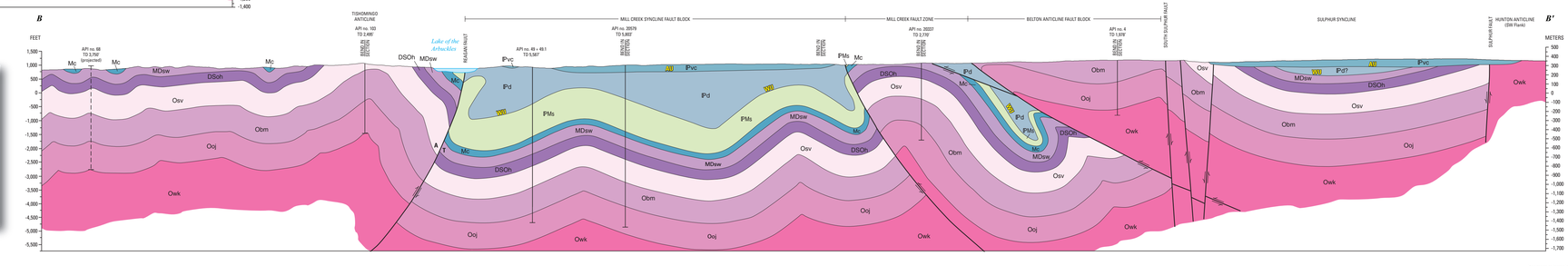


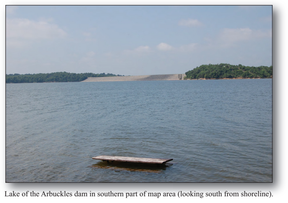
Figure 6. Map showing major structural features and related Pennsylvanian–age angular unconformities in and nearby Chickasaw National Recreation Area. Major faults (thick white lines); major folds and folded fault blocks (white italic labels); major Pennsylvanian-age angular unconformities (thin yellow lines); WU, Wichita unconformity; AU, Arbuckle unconformity; lines of cross sections denoted as thin red lines. Base map is 2008 National Agricultural Imagery Program (NAIP) photography on shaded relief derived from 10-m digital elevation data. Also shown as figure 6 in pamphlet.





Old abandoned quarry exposing Hunton Group (DSOh) and crest of Tishomingo anticline in southeastern part of map area (looking east-southeast).

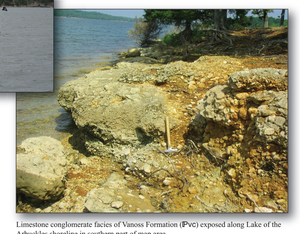




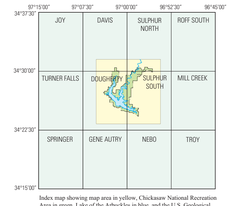
Lake of the Arbuckles dam in southern part of map area (looking south from shoreline).



Boat towing electromagnetic (EM) equipment during EM survey of the Lake of the Arbuckles.



Limestone conglomerate facies of Vanoss Formation (**IPvc**) exposed along Lake of the Arbuckles shoreline in southern part of map area.



Index map showing map area in yellow, Chickasaw National Recreation Area in green, Lake of the Arbuckles in blue, and the U.S. Geological Survey 7.5-minute quadrangles.

Table 2. *Table showing American Petroleum Information (API) number, total depth, and latitude and longitude for wells shown on the geologic map and in the cross sections. The drill hole data for these wells were taken from Puckett and others (2009) and used to constrain subsurface relations depicted in cross sections* ***A–A'*** *and* ***B–B'****.*

Abbreviated API no.	API Number	Total Depth TD (ft)	Latitude	Longitude
4	35099000040000	1,978	34.47721	-96.95467
33	35099000330000	7,334	34.42450	-97.07482
49	35099000490000	4,329	34.43054	-96.98911
49.1*	35099000490001	5,587	34.43054	-96.98911
68	35099000680000	3,750	34.39805	-97.02433
80	35099000800000	3,510	34.43974	-97.05405
103	35099001030000	2,495	34.41780	-97.00183
595	35099005950000	2,505	34.45553	-97.04121
20170	35099201700000	5,010	34.43042	-97.06308
20337	35099203370000	2,770	34.45806	-96.95865
20579	35099205790000	5,803	34.43763	-96.98206

* Well deepened from Abbreviated API no. 49.



Nine-banded armadillo (*Dasypus novemcinctus*)

CONVERSION FACTORS

Multiply	By	To obtain
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)

Altitude, as used in this report, refers to distance above the vertical datum.

Geologic Map of Chickasaw National Recreation Area, Murray County, Oklahoma

By

Charles D. Blome, David J. Lidke, Ronald R. Wahl, and James A. Golab

2013

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For more information concerning this publication, contact:
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Box 25046, Mail Stop 980
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