# PRELIMINARY SURFICIAL GEOLOGY OF THE WICHITA WEST QUADRANGLE, SEDGWICK COUNTY, KANSAS


**by William C. Parcell, William J. Swanson, John A. Wernert, and John W. Dunham**

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Cartographic assistance by Atefeh Hosseini



KANSAS GEOLOGICAL SURVEY
The University of Kansas

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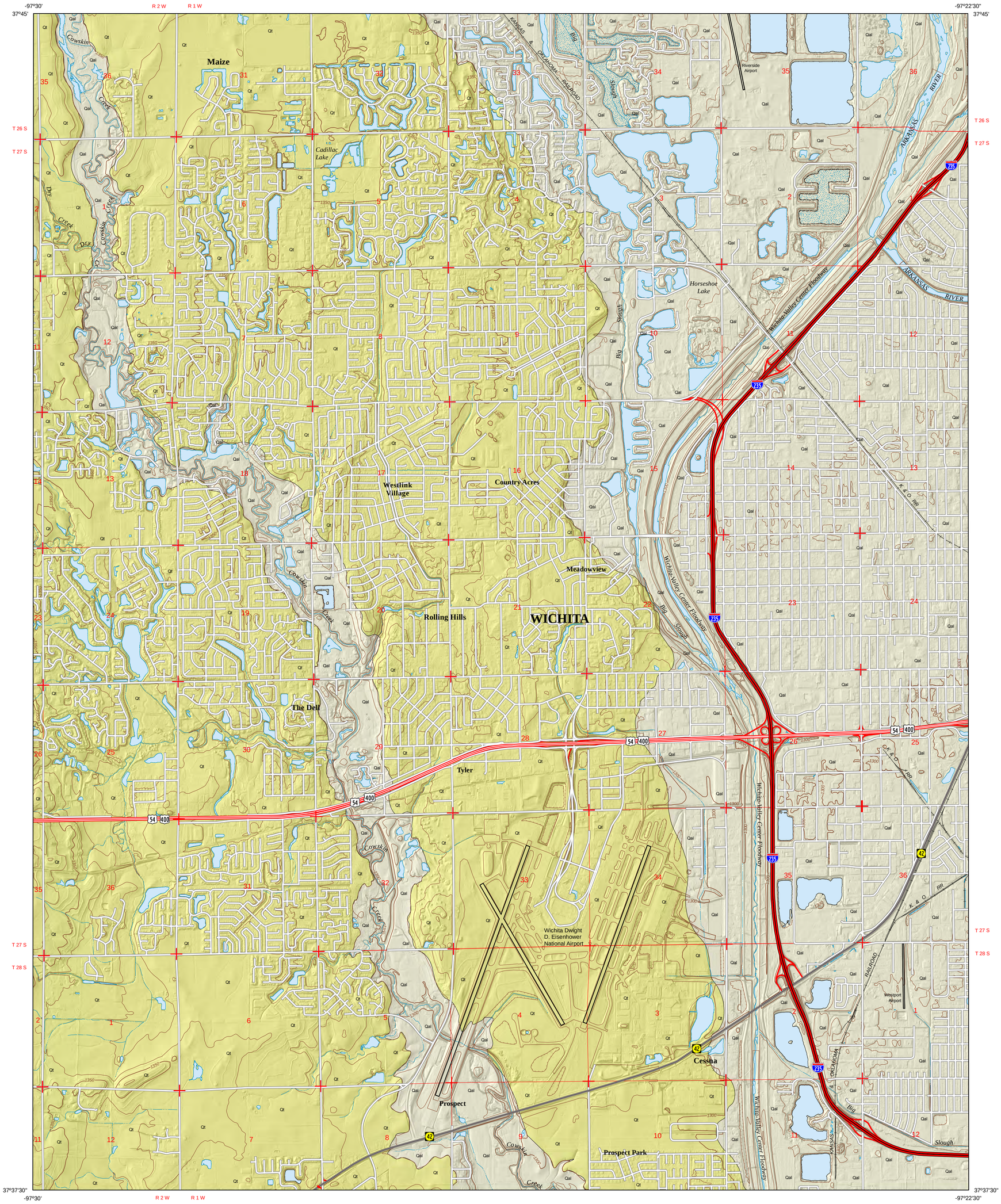


## GEOLOGIC UNITS

### CENOZOIC

**Quaternary System**
**Pleistocene-Holocene**

Qal

**Alluvium** — Alluvium in Sedgwick County is fine to coarse sand and fine to coarse arkosic gravel containing minor amounts of silt and clay that grade upward into clayey silt. Alluvium from the Arkansas River is composed of unconsolidated gravel, sand, and silt and has an estimated thickness of 75 ft (23 m) (Williams and Lohman, 1949). Pleistocene-age alluvium is present to a depth of nearly 50 ft (15 m) and Pleistocene to possibly Pliocene alluvium to a depth of more than 180 ft (55 m) total (Lane and Miller, 1965). Alluvium is of Quaternary age and lines the floodplain of the Little Arkansas River with limited extension up smaller creeks. In certain areas, alluvium may form low terraces 10–20 ft (3–6 m) above the floodplain (Aber, 1991). Alluvial sediment in smaller creeks is composed of finer sediment and variable in lithology (Moore et al., 1951) and sourced from weathering and erosion of silt, shale, and carbonates in the Permian Wellington Formation and Pleistocene loess.

Qt

**Alluvial terrace deposits** — The terrace deposits in Sedgwick County consist of unconsolidated alluvial and floodplain sediments in the Arkansas River floodplain (Lane and Miller, 1965). Terraces are predominantly gravel, sand, clay, and silt varying in thickness and occasionally form clay and silt lenses (Bayne and O'Connor, 1968). In nearby Cowley County, the lower part consists of silt, clay, and arkosic sand and gravel with predominantly arkosic gravel along larger river valleys (Bayne, 1962). Sand and gravel beds are also known to contain clay and silt lenses locally (Bayne and O'Connor, 1968). Loess-derived silts, largely yellowish to reddish-brown in color, are found in the upper portion of these terrace deposits. These loess-derived deposits are on the order of 40 ft (12 m) thick in the Sedgwick County area (Lane and Miller, 1965). Later rejuvenation of the Arkansas River caused the river's incision into earlier terrace and alluvial deposits. This process deposited arkosic sand and gravel and subsequently silt and clay deposits (Bayne, 1962). In south-central Kansas, this formation is derived from Paleozoic and Mesozoic deposits and can reach 55 ft (17 m) in thickness (Bayne, 1962).

## CITED REFERENCES


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Williams, C. C., and Lohman, S. W., 1949, Geology and ground-water resources of a part of south-central Kansas, with special references to the Wichita municipal water supply, with analyses by Robert H. Hess and others: Kansas Geological Survey, Bulletin 79, 455 p.


## EXPLANATION

**Boundaries and Locations**
- Township/range line
- Section line
- Section corner

**Transportation**
- Interstate highway
- U.S. highway
- State highway
- Local road
- Railroad
- Airport runway

**Hydrology and Topography**
- Perennial stream
- Intermittent stream
- Water body
- Water body – intermittent
- Water body – manmade shoreline
- Elevation contour (50-foot interval)
- Elevation contour (10-foot interval)
- Depression contour (50-foot interval)
- Depression contour (10-foot interval)

**Geologic Unit Boundaries**
- Observed contact

Elevation contours are presented for general reference. Used in the U.S. Geological Survey's current US Topo 1:24,000-scale topographic map series, they were generated from hydrographically improved 1/3 arc-second National Elevation Dataset (NED) data and smoothed during processing for use at 1:24,000 scale. In some places, the contours may be more generalized than the base data used for compilation of geologic outcrop patterns. Outcrop patterns on the map will typically reflect topographic variation more accurately than the associated contour lines. Repeated fluctuation of an outcrop line across a contour line should be interpreted as an indication that the mapped rock unit is maintaining a relatively constant elevation along a generalized contour.

1/9 arc-second (3.4-meter) LiDAR hillshades and 1-meter U.S. Department of Agriculture – Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) 2009 digital imagery were used as references in the digital mapping. USGS 7.5-minute 1:24,000-scale topographic maps, USDA Natural Resources Conservation Service (NRCS) Web Soil Survey Geographic Database (SSURGO), and other geologic maps, bulletins, and GIS data were also used in the mapping. Roads and highways are shown on the base map as represented by data from the U.S. Census Bureau. U.S. Department of Agriculture – Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) imagery also was used to check road locations.

Shaded relief is based on 1-meter hydroflattened bare-earth DEMs from the State of Kansas LiDAR Database. The DEM images, in ERDAS IMAGINE format, were mosaicked into a single output DEM, downsampled to 2-meter resolution, and reprojected to decimal degrees. The output DEM was then converted to a hillshade, a multidirectional shaded-relief image using angles of illumination from 0°, 225°, 270°, and 315° azimuths, each 45° above the horizon, with a 4x vertical exaggeration.


This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program, award number G18AC00197 (FY2018).


This map was produced using the ArcGIS system developed by Esri (Environmental Systems Research Institute, Inc.).

This map is a preliminary product and has had less scientific and cartographic review than the Kansas Geological Survey's M-series geologic maps. KGS does not guarantee this map to be free from errors or inaccuracies and disclaims any responsibility or liability for interpretations made from the map or decisions based thereon.

**SUGGESTED REFERENCE TO THE MAP**

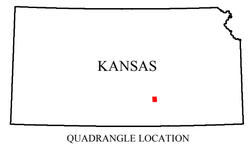
Parcell, W. C., Swanson, W. J., Wernert, J. A., and Dunham, J. W., 2019, Preliminary surficial geology of the Wichita West quadrangle, Sedgwick County, Kansas: Kansas Geological Survey, Open-File Report 2019-12, scale 1:24,000, unpublished.

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14
NORTH AMERICAN DATUM OF 1983


APPROXIMATE MEAN DECLINATION, 2019




QUADRANGLE LOCATION

| | | |
|---|---|---|
| Colwich | Maize | Valley Center |
| Goddard | Wichita West | Wichita East |
| Clearwater | Bayneville | Derby |

ADJOINING 7.5' QUADRANGLES