

PRELIMINARY SURFICIAL GEOLOGY OF THE LOGAN COUNTY PORTION OF THE ELKADER QUADRANGLE, KANSAS

by David A. Sawyer

2023

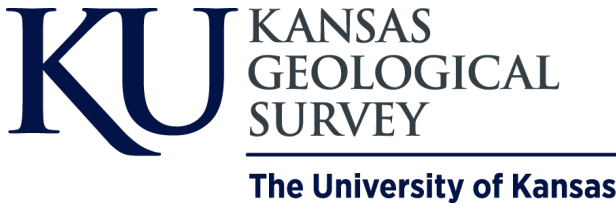
Computer compilation and cartography by Kolbe D. Andrzejewski



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



ELKADER QUADRANGLE
KANSAS
7.5-MINUTE SERIES



Open-File Report 2023-34

Funded in part by the
USGS National Cooperative
Geologic Mapping Program

GEOLOGIC UNITS

CENOZOIC

Quaternary System
Holocene

Qal ₁	Undifferentiated floodplain alluvium
Qt	Alluvial terrace deposits
Ql	Loess

Neogene System

No	Ogallala Formation
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MESOZOIC

Cretaceous System
Upper Cretaceous Series
Colorado Group

Kps	Pierre Shale
Kns	Smoky Hill Chalk

EXPLANATION

Geologic Unit Boundaries

- Observed contact
- Fault - identity and existence certain, location accurate

SOURCES

- Arbogast, A.F., and Johnson, W.C., 1996, Surficial geology and stratigraphy of Russell County, Kansas: Kansas Geological Survey, Technical Series 7, 45 p.
- Bell, E.L., 1964, Soil survey of Logan County, Kansas: U.S. Department of Agriculture, Soil Conservation Service, 78 p.
- Elias, M.K., 1931, The geology of Wallace County, Kansas: Kansas Geological Survey Bulletin, 18, 254 p.
- Gill, J.R., Cobban, W.A., and Schultz, L.G., 1972, Stratigraphic and composition of the Sharon Springs Member of the Pierre Shale in western Kansas: U.S. Geological Survey Professional Paper 728, 55 p.
- Hatlin, D.E., 1982, Stratigraphy and depositional environment of Smoky Hill Chalk Member, Niobrara Chalk (Upper Cretaceous) of the type area, western Kansas: Kansas Geological Survey, Bulletin 225, 108 p.
- Johnson, C.R., 1958, Geology and ground-water resources of Logan County, Kansas: Kansas Geological Survey, Bulletin 129, 177 p.
- Johnson, W.C., and Arbogast, A.F., 1993, Geologic map, Phillips County, Kansas, with emphasis on the Quaternary Period: Kansas Geological Survey, Technical Series 1, 66 p.
- Johnson, W.C., and Arbogast, A.F., 1996, Geologic map of Russell County, Kansas: Kansas Geological Survey, Map M-37, scale 1:50,000, 42.5 x 45 inches.
- Neuhauser, K.R., and Pool, J.C., 1988, Geologic map, Ellis County, Kansas: Kansas Geological Survey, Map M-19, scale 1:53,870, 48 x 39 inches.
- Neuhauser, K.R., Wilcox, T.M., and Schumacher, B.A., 1996, Geologic map of Ness County, Kansas: Kansas Geological Survey, Map M-47, scale 1:50,000, 40 x 40 inches.
- Zeller, D. E., ed., 1968, The stratigraphic succession in Kansas: Kansas Geological Survey, Bulletin 189, 81 p.

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-meter LiDAR hillshades and 1-meter 2020 U.S. Department of Agriculture - Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) digital imagery were used as references in the digital mapping. USGS 7.5-min 1:24,000-scale topographic maps, USDA Natural Resources Conservation Service (NRCS) soil surveys, and other geologic maps and bulletins were used to supplement the mapping. Roads and highways are shown on the base map as represented by data from the Kansas Department of Transportation (KDOT), U.S. Census Bureau, and other sources. USDA-FSA 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 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, StateMap award number G22AC00574 (FY2022).

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

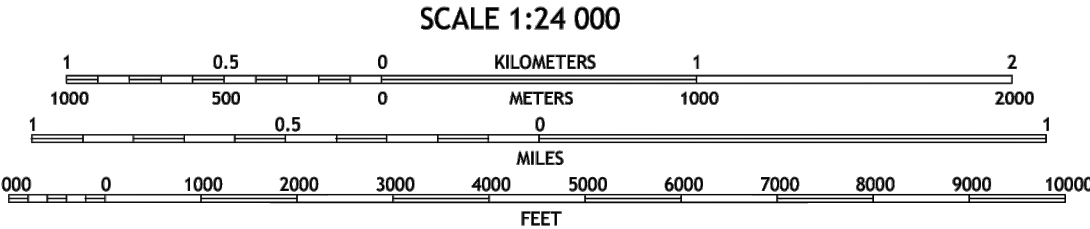
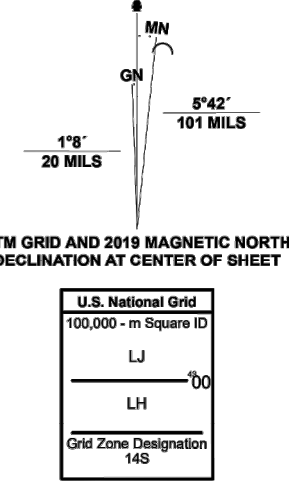
This map is a preliminary product and has had less scientific and cartographic review than the Kansas Geological Survey's M-series geologic maps. The KGS does not guarantee this map to be free from errors or inaccuracies and disclaims any responsibility or liability for interpretations made from the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



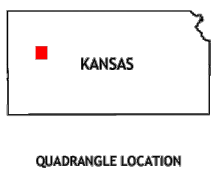
Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NMAP, July 2017 - September 2017
Roads.....U.S. Census Bureau, 2015 - 2018
Hydrography.....National Hydrography Dataset, 2006 - 2015
Contours.....National Elevation Dataset, 2018
Boundaries.....Multiple sources; see metadata file 2019 - 2021
Public Land Survey System.....BLM, 2018
Wetlands.....FWS National Wetlands Inventory 1985 - 1985

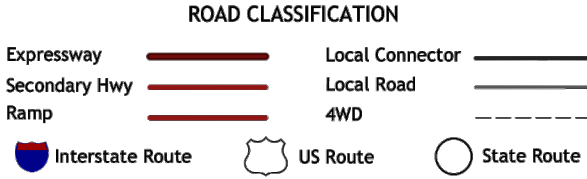


CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard.



1	2	3	1 Elkader NW
4	5	2 Elkader NE	
6	7	3 Orion	
8	9	4 Elkader SW	
10	11	5 Orion SW	
12	13	6 Lake Scott	
14	15	7 Lake Scott NE	
16	17	8 Healy NW	

ADJOINING QUADRANGLES



ELKADER, KS
2022

SUGGESTED REFERENCE TO THE MAP

Sawyer, D.A., 2023, Preliminary surficial geology of the Logan County portion of the Elkader quadrangle, Kansas: Kansas Geological Survey, Open-File Report 2023-34, scale 1:24,000, unpublished.