

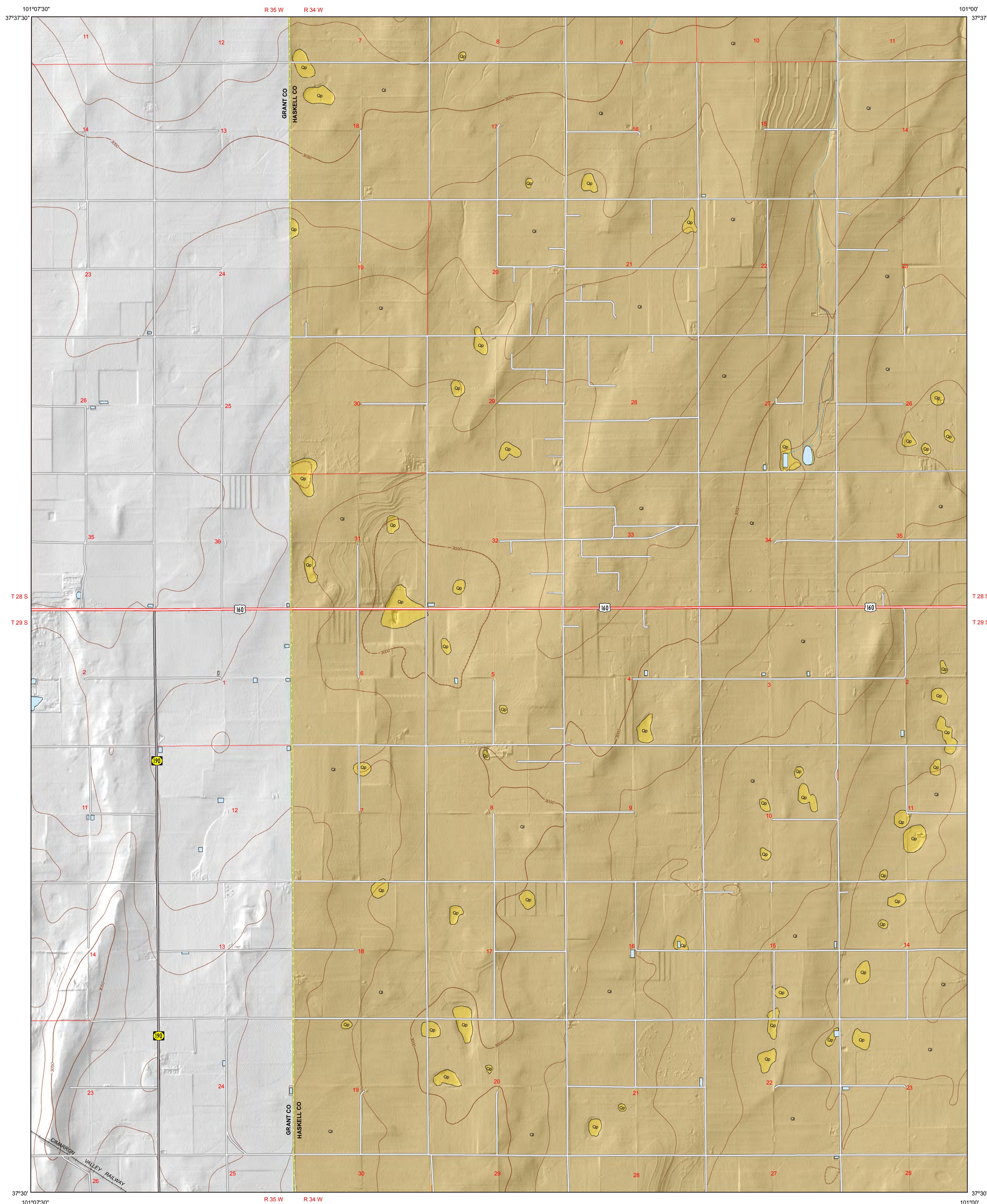
# PRELIMINARY SURFICIAL GEOLOGY OF THE HASKELL COUNTY PORTION OF THE HICKOK SE QUADRANGLE, KANSAS

Geology by Jon J. Smith

2014

Computer compilation and cartography by John W. Dunham and Dustin A. Fross

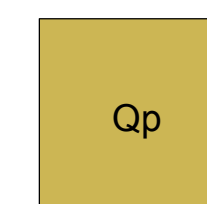
Funded in part by the  
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Geologic Mapping Program



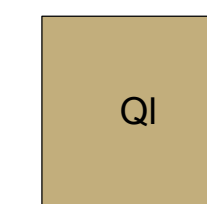
Units and Descriptions from  
McLaughlin (1946) and field notes.

### CENOZOIC ROCKS

#### Quaternary



**Upland intermittent lake (playa) deposits** — Shallow basins developed in upland loess deposits filled with silt and fine sand up to 5 feet thick. A carbonate layer may be present in larger basins.



**Loess** — Wind-deposited silt with minor amounts of clay and fine sand which mantles the uplands of the county. Pleistocene to late Holocene in age and up to 30 feet thick.

### EXPLANATION

#### Boundaries and Locations

- County boundary
- Township/range line
- Section line

#### Transportation

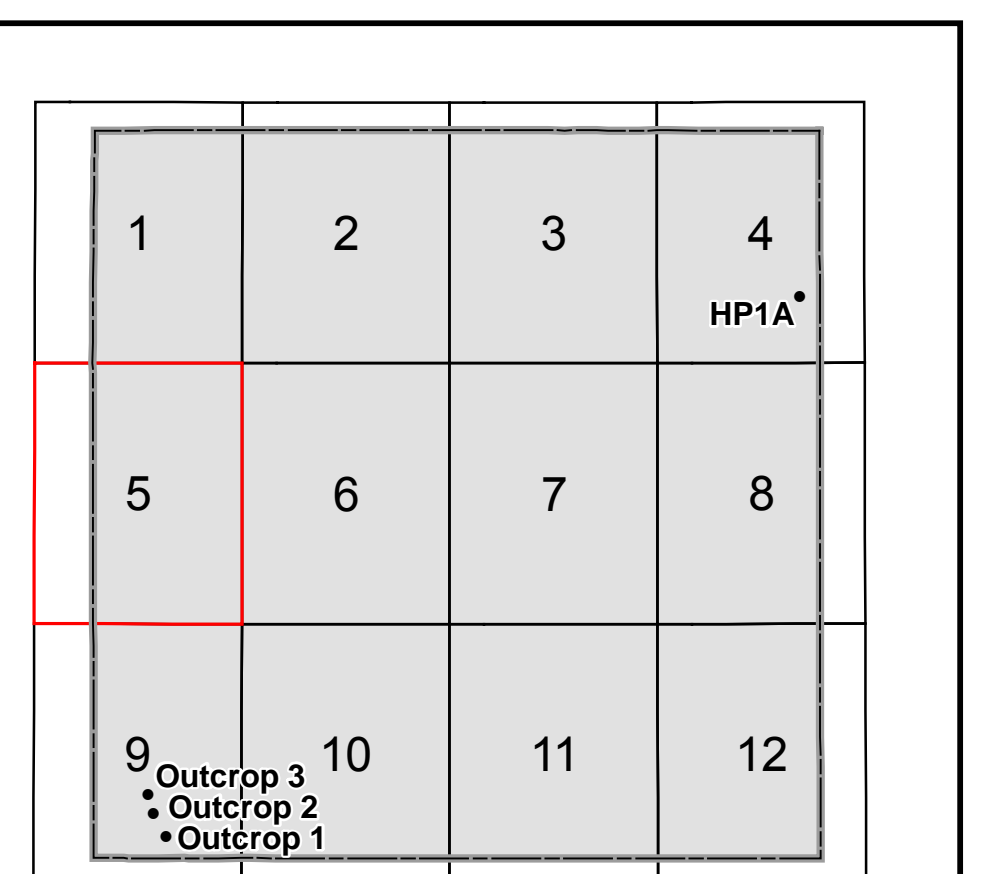
- U.S. highway
- State highway
- Local road
- Railroad

#### Geologic Unit Boundaries

- Observed contact

#### Hydrology and Topography

- Intermittent stream
- Water body - manmade shoreline
- Elevation contour (50-foot interval)
- Elevation contour (10-foot interval)
- Depression contour (10-foot interval)



HASKELL COUNTY QUADRANGLES AND LOCATIONS OF ANALYTICAL SAMPLES (TABLE 1)

- 1 Hickok NE
- 2 West of Wild Horse Lake
- 3 Wild Horse Lake
- 4 Copeland NW
- 5 Hickok SE
- 6 North of Satanta
- 7 West of Copeland
- 8 Copeland
- 9 Ryus
- 10 Satanta
- 11 Sublette
- 12 Plains NW

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.

2012 U.S. Department of Agriculture - Farm Services Agency (USDA-FSA) National Agriculture Imagery Program (NAIP) digital imagery and 2002 USDA-FSA digital black and white orthophotos were used as reference in the digital mapping. USGS 7.5-min 1:24,000-scale topographic maps and USDA Natural Resources Conservation Service (NRCS) soil surveys 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. 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 5-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 G13AC00168 (FY2013).

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.

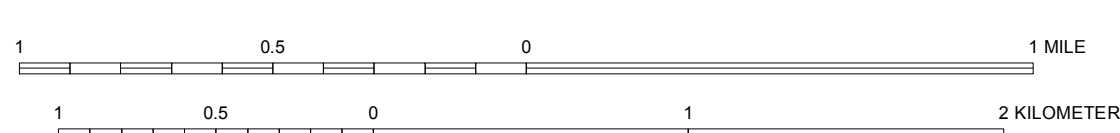
#### REFERENCE

McLaughlin, T.G., 1946, Geology and ground-water resources of Grant, Haskell, and Stevens counties, Kansas, with analyses by H.A. Stoltenberg: Kansas Geological Survey, Bulletin, no. 61, 221 p.

#### SUGGESTED REFERENCE TO THE MAP

Smith, J. J., 2014, Preliminary surficial geology of the Haskell County portion of the Hickok SE quadrangle, Kansas: Kansas Geological Survey, Open-file Report 2014-8, scale 1:24,000, unpublished.

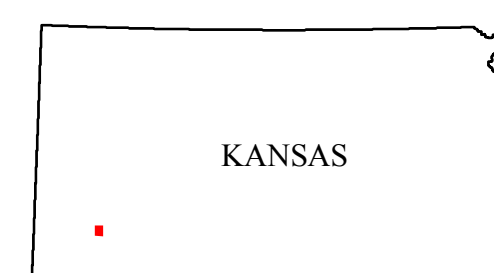
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UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14  
NORTH AMERICAN DATUM OF 1983

TRUE NORTH  
MAGNETIC NORTH

APPROXIMATE MEAN  
DECLINATION, 2014



QUADRANGLE LOCATION

Location (Lat/Long)	Core	Meter Interval	Dating Technique	Analytical Results
N37° 39' 24" W100° 39' 52"	HP1A	03.9-04.2	OSL	44.3 ± 7.8 Ka
N37° 39' 24" W100° 39' 52"	HP1A	06.9-07.1	OSL	54.0 ± 8.9 Ka
N37° 39' 24" W100° 39' 52"	HP1A	07.5-07.8	OSL	70.3 ± 10.6 Ka
N37° 39' 24" W100° 39' 52"	HP1A	08.2-08.5	OSL	75.7 ± 11.3 Ka
N37° 39' 24" W100° 39' 52"	HP1A	09.3-09.5	OSL	76.1 ± 13.5 Ka
N37° 39' 24" W100° 39' 52"	HP1A	11.9-12.1	OSL	76.8 ± 13.1 Ka
N37° 39' 24" W100° 39' 52"	HP1A	15.2-17.0	U/Pb zircon	35.9 ± 0.6 Ma
N37° 39' 24" W100° 39' 52"	HP1A	18.9-20.7	U/Pb zircon	35.7 ± 0.6 Ma
N37° 39' 24" W100° 39' 52"	HP1A	30.8-32.0	U/Pb zircon	36.3 ± 0.6 Ma
N37° 39' 24" W100° 39' 52"	HP1A	33.5-34.5	U/Pb zircon	35.3 ± 0.5 Ma
N37° 39' 24" W100° 39' 52"	HP1A	52.6-53.6	U/Pb zircon	33.4 ± 0.7 Ma
N37° 39' 24" W100° 39' 52"	HP1A	88.0-89.0	U/Pb zircon	38.0 ± 1.4 Ma
N37° 39' 24" W100° 39' 52"	HP1A	94.0-96.0	U/Pb zircon	69.3 ± 2.3 Ma
N37° 23' 54" W101° 2' 45"	Outcrop	1.35-1.45	14C	15020 ± 90 14C yr B.P.
N37° 23' 54" W101° 2' 45"	Outcrop	2.7-2.8	14C	11120 ± 70 14C yr B.P.
N37° 23' 54" W101° 2' 45"	Outcrop	3.2-3.3	14C	10490 ± 70 14C yr B.P.
N37° 23' 54" W101° 2' 45"	Outcrop	3.5-3.6	14C	10890 ± 70 14C yr B.P.
N37° 24' 34" W101° 3' 12"	Outcrop	2.0-2.1	14C	23330 ± 170 14C yr B.P.
N37° 24' 34" W101° 3' 12"	Outcrop	2.4-2.5	14C	14710 ± 130 14C yr B.P.
N37° 25' 5" W101° 3' 24"	Outcrop	3.5-3.7	U/Pb zircon	64.2 ± 3.2 Ma

Table 1. Results from geochronologic analyses of sections of the HP1A core and outcrop samples from terraces along the Cimarron River valley. OSL: Optically Stimulated Luminescence; U/Pb zircon: dates from volcanogenic zircons via LA-ICP-MS; 14C: radiocarbon dates.