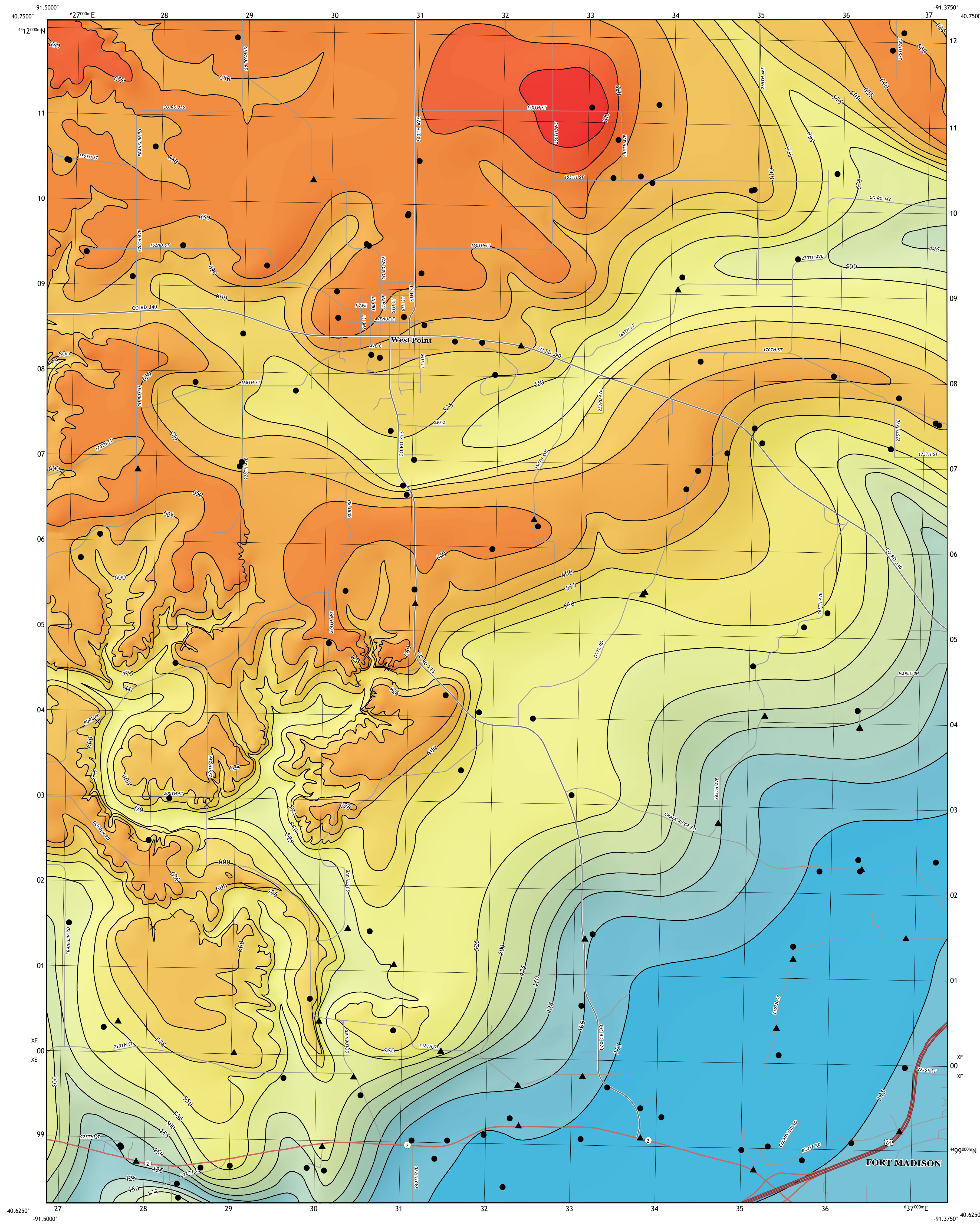


Bedrock Elevation and Quaternary Thickness Maps of the West Point 7.5' Quadrangle, Lee County, Iowa

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Open File Map: OFM-20-6

Bedrock Elevation



INTRODUCTION

The Bedrock Elevation and Quaternary Thickness Maps of the West Point 7.5' Quadrangle were produced in conjunction with the surficial and bedrock geologic maps. The bedrock surface within the quadrangle, like much of Iowa, is mostly concealed by glacial deposits. The boundary between Paleozoic bedrock and unconsolidated Quaternary materials is likely just as irregular as the land surface itself. Therefore, the thickness of Quaternary deposits varies widely across the quadrangle, generally ranging from 0 to 18 m (60 ft) and reaching over 97 m (320 ft) thick based on well data in the southeastern portion of the mapping area. In contrast, bedrock exposures are common in the western portion of the quadrangle along Sugar Creek and its tributaries.

Bedrock topographic lines were drawn based on borehole data coupled with bedrock outcrop occurrences identified while constructing the Bedrock Geologic Map of the West Point 7.5' Quadrangle (OFM-20-4). Where the bedrock surface is exposed or lies within a few feet of the land surface, the bedrock topography essentially mirrors the land surface topography, such as along Sugar Creek in the western part of the map area. Bedrock topographic detail is muted where boreholes intersecting the bedrock surface are scarce or at greater depth, such as the bedrock valley in the southeastern part of the map. The thickness of Quaternary materials was generated by subtracting the elevation of the bedrock surface from the land surface elevation. The Surficial Geologic Map of the West Point 7.5' Quadrangle (OFM-20-5) provides further information regarding the nature and extent of Quaternary deposits within the mapping area.

METHODOLOGY

The Bedrock Elevation and Quaternary Thickness Maps of the West Point 7.5' Quadrangle were constructed using the same datasets as the surficial and bedrock geologic maps. Geologic information utilized included drilling records housed in the Iowa Geological Survey (IGS) GeoSam database, existing maps and technical reports, Iowa Department of Transportation data, and reports from engineering companies and quarry operators. Field reconnaissance of seven bedrock outcrops and one abandoned quarry was completed as well as the collection of 36 passive seismic data points.

More than 200 boring records from the IGS GeoSam database, including both driller's logs and lithologic descriptions of well cutting samples (strip logs), were evaluated for the West Point Quadrangle. Each record was checked for locational accuracy using information from the driller's logs, historic plat books, county assessor information, and direct communication with landowners. The depth to the surficial bedrock contact was determined for each well and assigned an elevation value by subtracting it from the surface digital elevation model (DEM). These data points provided the framework for the Bedrock Elevation Map. Additional information was gained from an assessment of the Natural Resources Conservation Service county soil survey by identifying soil series that indicate shallow bedrock.

Bedrock elevation contours were digitized manually on screen using ArcGIS software at a 25-foot contour interval. The bedrock elevation raster was generated using interpolations of the bedrock surface created with the "Topo to Raster" and "Empirical Bayesian Kriging" tools in ArcMap 10.6. The Quaternary Thickness Map was created by subtracting the bedrock elevation raster from the surficial DEM raster. The resulting surface was rounded to the nearest integer and contours were generated from this result then then smoothed.

BEDROCK ELEVATION

Red	≥700
Orange	≥675
Light Orange	≥650
Yellow-Orange	≥625
Yellow	≥600
Light Yellow	≥575
Yellow-Green	≥550
Light Green	≥525
Green	≥500
Light Green	≥475
Green	≥450
Light Green	≥425
Green	≥400
Light Blue	≥350

MAP SYMBOLS

- bedrock outcrop
- GeoSam point
- new drill core
- geophysics point
- quarry
- topographic line
- hillshade

ROAD CLASSIFICATION

- U.S. Route
- State Route

QUATERNARY THICKNESS

Red	≤25
Orange	≤50
Light Orange	≤75
Yellow-Orange	≤100
Yellow	≤125
Light Yellow	≤150
Yellow-Green	≤175
Light Green	≤200
Green	≤225
Light Green	≤250
Green	≤275
Light Green	≤300
Green	≤325
Light Blue	≤350

ADJOINING QUADRANGLES

1	2	3
4	5	6
7	8	

1 Salem, IA
2 Lowell, IA
3 Danville, IA
4 Donnellson, IA
5 Fort Madison, IA-IL
6 Argyle, IA-MO
7 Narrows, IA-IL
8 Niota, IA-IL

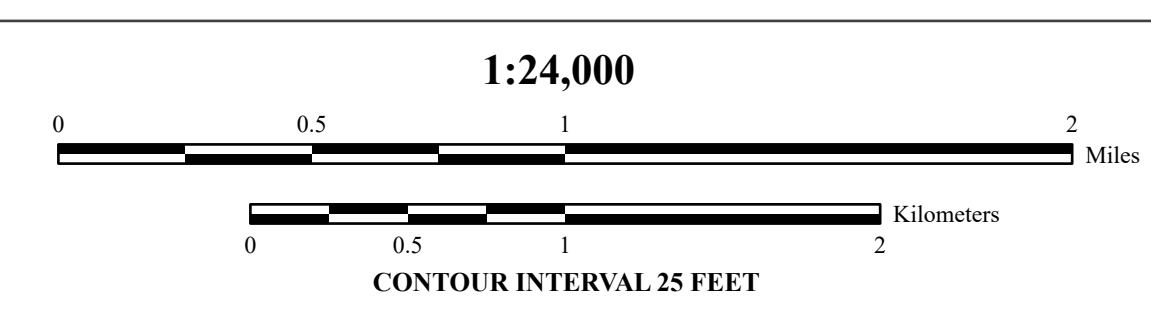
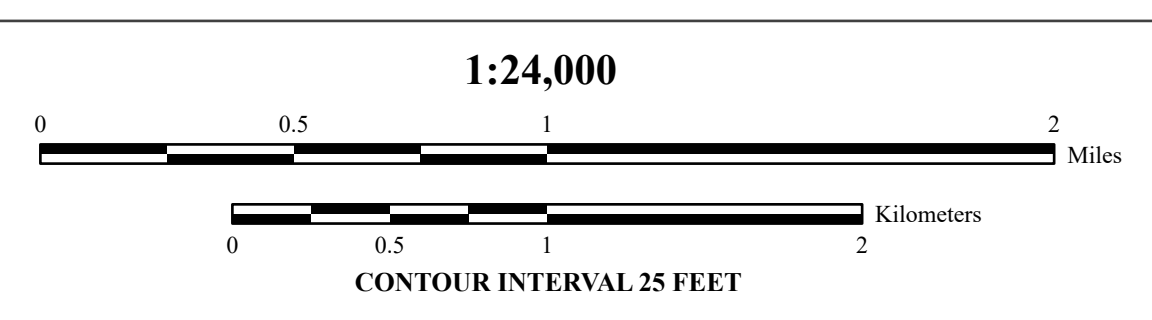
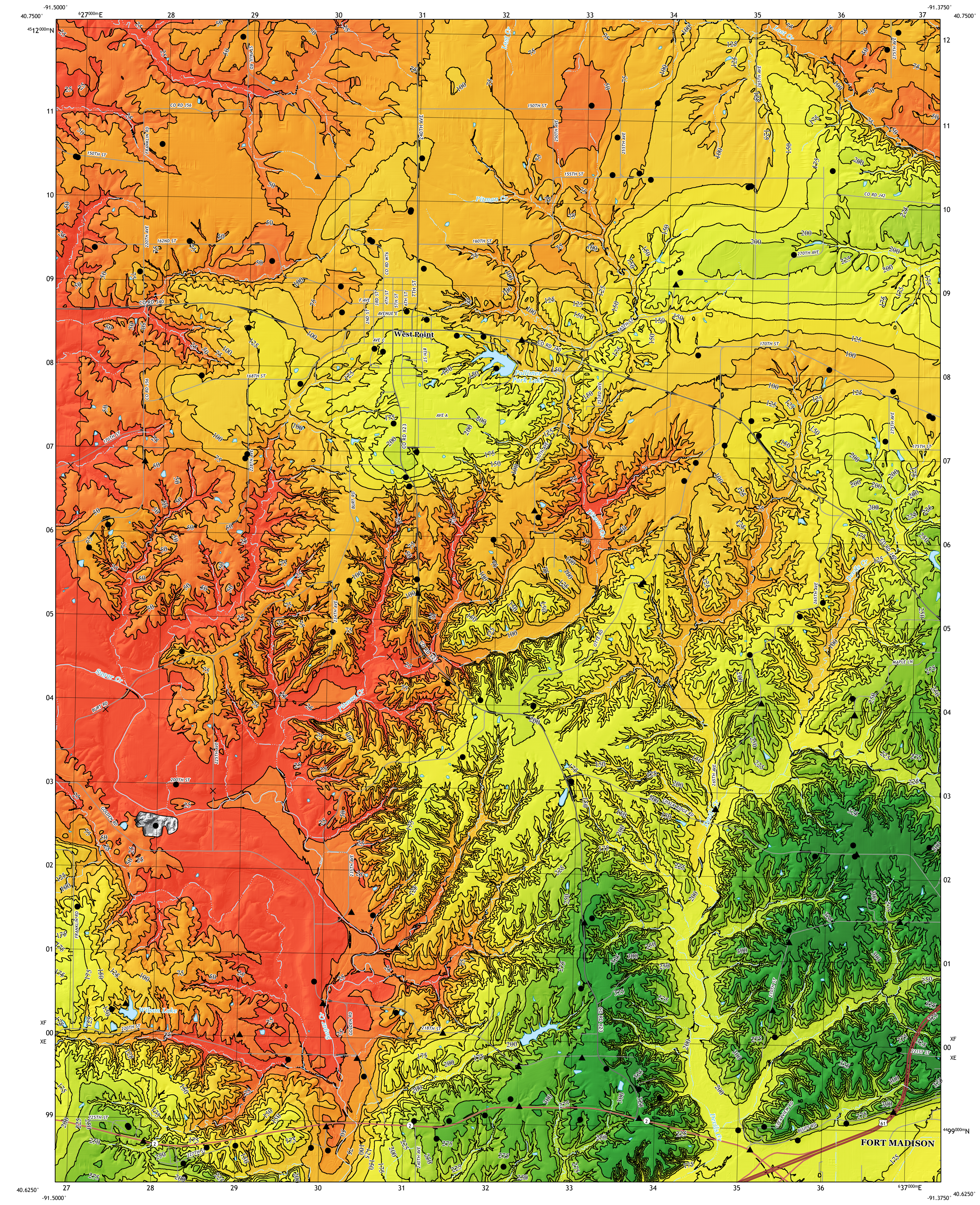
UTM GRID AND 2020 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

0°54' 16 MILS
1°11' 18 MILS

ACKNOWLEDGEMENTS

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Quaternary Thickness



Base map from the USGS West Point 7.5' Quadrangle map, published by the US Geological Survey in 2018. Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15N, datum NAD83.

The maps are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site-specific studies. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the US Government.

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