

Bedrock Geology of the Manly (Iowa)

7.5' Quadrangle

INTRODUCTION

The Manly 7.5' Quadrangle of Worth and Cerro Gordo counties, Iowa, is located in the border area of the Des Moines Lobe landform, an area of glacial drift deposited by the Late Wisconsin ice advance into north-central Iowa, and the Iowan Surface landform, a region characterized by various episodes of erosion before the Wisconsin glacial events (Prior, 1991). Most of the quad is covered by Quaternary glacial and alluvial deposits. Bedrock outcrops mostly occur along the Shell Rock River, and some occur by Beaver Creek in the southeast part of the quad.

Middle and lower Upper Devonian carbonate rocks of shallow-marine origin comprise the bedrock strata in the mapping area. The strata form the upper part of a thick Devonian carbonate succession within the northern portion of the Iowa Basin. Belanski (1927) conducted early investigations of the stratigraphy and paleontology of these limestones and dolomites. This was followed by Koch's (1970) establishment of the Shell Rock Formation, and extensive additional stratigraphic revisions by Witzke and Bunker (1984), Witzke and others (1988), Anderson and Bunker (1998), and Groves and others (2008). Stratigraphic nomenclature and correlation for this map follow the stratigraphy of Witzke and others (1988). In addition to the bedrock outcrops and nearby quarries, subsurface information for bedrock geologic mapping of this quad is derived from the analysis of water well cuttings samples. A total of about 60 wells are present within the quad, the data for which are stored in the GEOSAM database of Iowa Geological and Water Survey.

The bedrock strata in the map area are carbonates of Cedar Valley Group; they vary between limestone and dolomite with minor shale. Bedrock is subdivided into the Shell Rock and Lithograph City formations, and is dominated by the Shell Rock Formation. The Shell Rock Formation is characterized by fossiliferous and stromatopore-rich carbonates. The underlying Lithograph City Formation, typically composed of laminated lithographic and sublithographic limestone and dolomite, occurs along the Shell Rock River and in a subsurface valley in the western part of the quad.

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BEDROCK GEOLOGY OF THE MANLY 7.5' QUADRANGLE, WORTH AND CERRO GORDO COUNTIES, IOWA

Iowa Geological and Water Survey
Open File Map OFM-10-3
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prepared by

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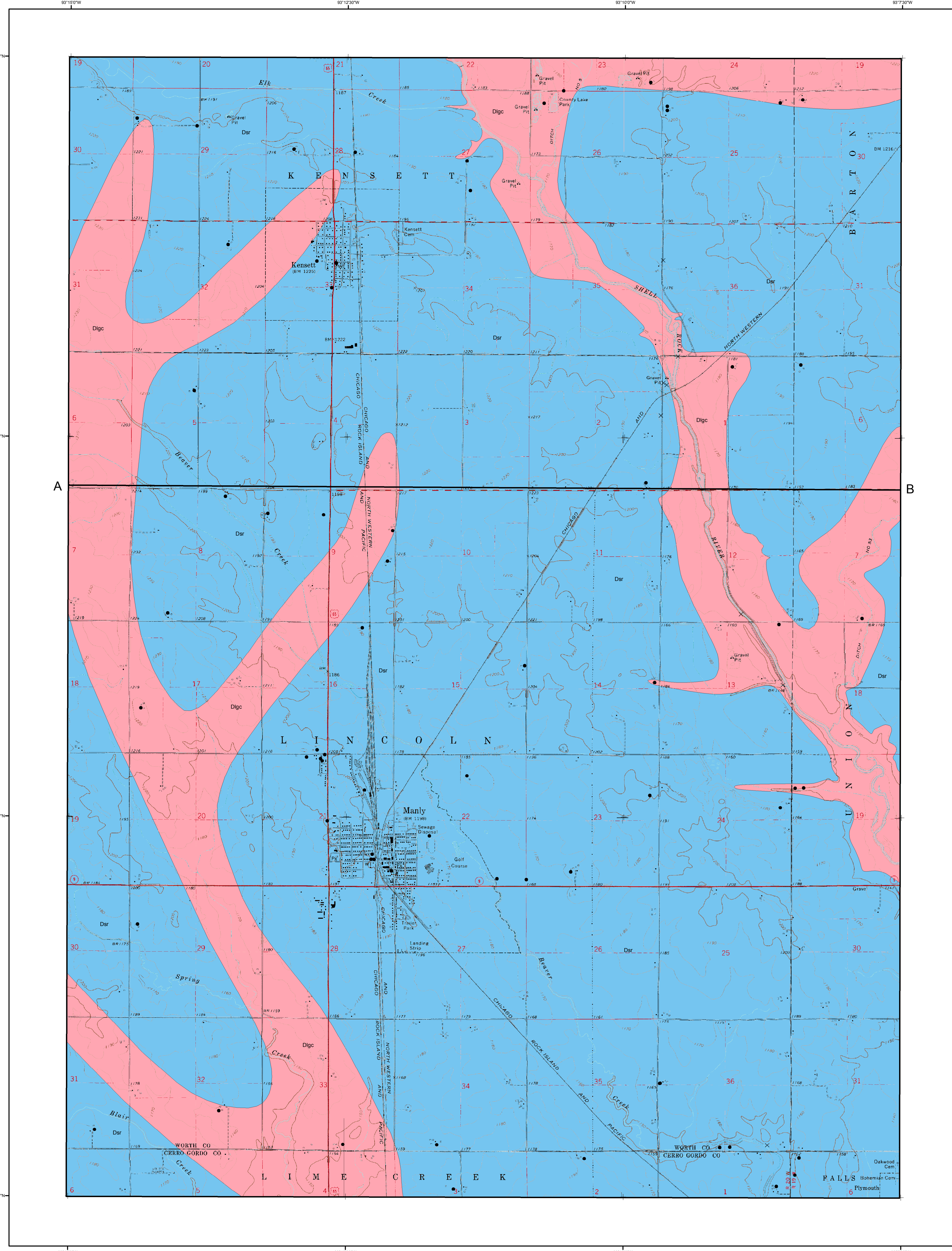


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LEGEND

CENOZOIC

QUATERNARY SYSTEM

Qu - **Undifferentiated unconsolidated sediment** Consists of loamy soils developed in loess, glacial till, and colluvium of variable thickness, and alluvial clay, silt, sand and gravel. Total thickness can be up to 30 m (100 ft) in the quad. This unit is shown only on cross-section, not on map.

PALEOZOIC

DEVONIAN SYSTEM

Dsr - **Limestone, Dolomite, and Shale** (Shell Rock Formation) Upper Devonian. This formation is the major top bedrock unit in the quad, usually with a thickness of 12 to 18 m (40-60 ft). It is characterized by fossiliferous carbonates with some shale. Layers with abundant subhorizontal and tabular stromatopores, which may be replaced by calcite crystal masses, commonly occur in the lower part of the formation. Brachiopods, bryozoans, corals, and crinoids are abundant in parts.

Dlgc - **Dolomite, Limestone, and Shale** (Lithograph City Formation) Middle to Upper Devonian. Maximum thickness of this map unit is up to 33 m (110 ft). It is characterized by interbeds of fossiliferous to sparsely fossiliferous laminated lithographic and sublithographic limestone and dolomite limestone, in part argillaceous or with slight shale. "Birdseye" carbonate facies is common in some layers.

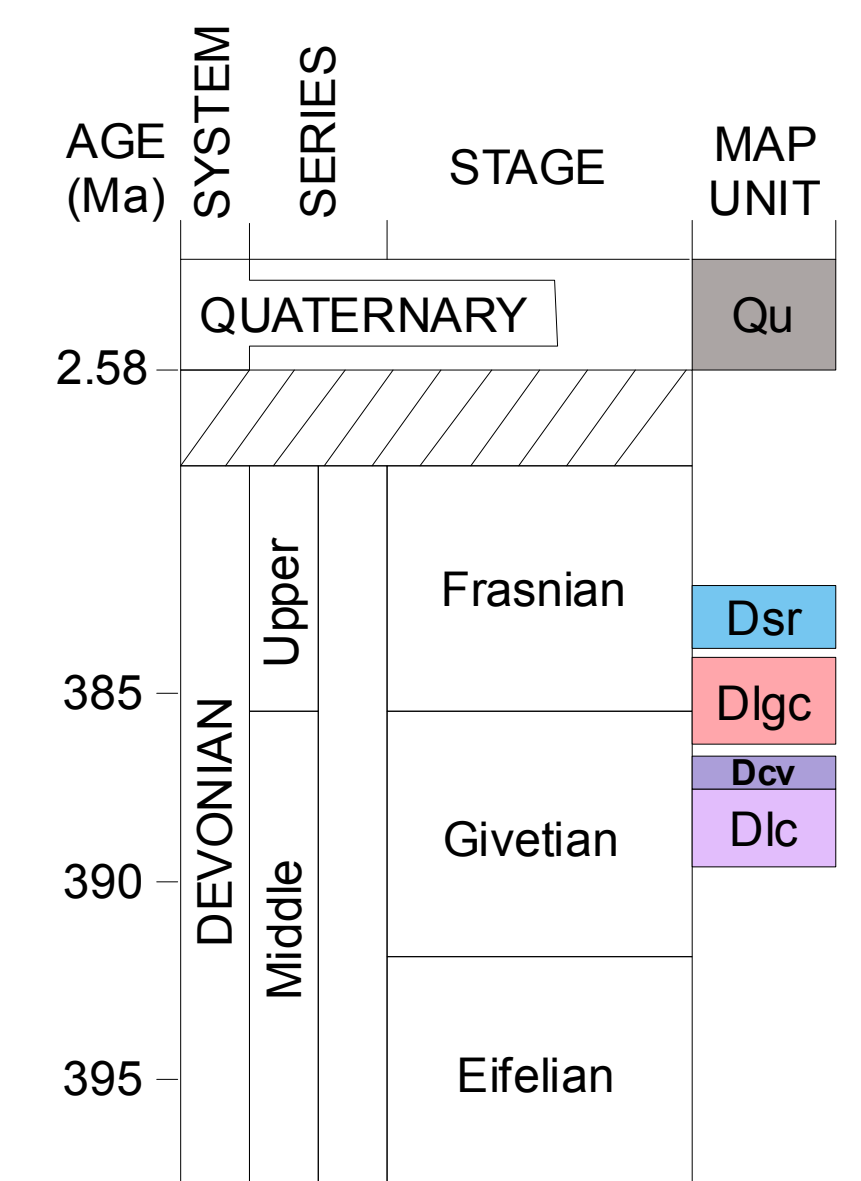
Dcv - **Limestone and Dolomite** (Coralville Formation) Middle Devonian. Thickness of this formation varies between 10 and 18 m (33-60 ft) and is dominated by limestone, dolomite limestone, and dolomite, in part laminated and argillaceous. Brachiopods and corals usually occur in the limestone facies. This unit is shown only on cross-section, not on map.

Dlc - **Dolomite and Limestone** (Little Cedar Formation) Middle Devonian. Thickness of this formation ranges from 27 to 36 m (90-120 ft) in this area. It is dominated by slightly argillaceous to argillaceous dolomite and dolomite limestone, usually vuggy and partially laminated and/or cherty. This unit is commonly fossiliferous and brachiopods are especially abundant in lower portion. This unit is shown only on cross-section, not on map.

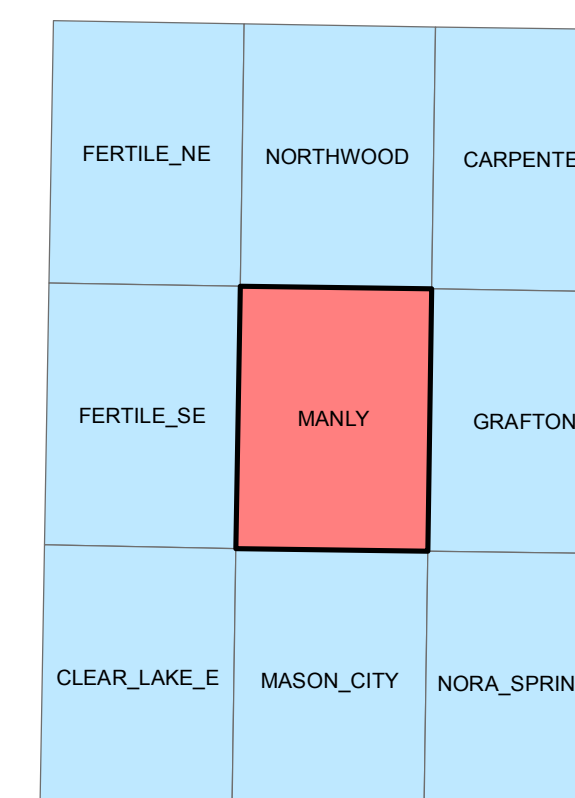
• Drill Holes

× Outcrops

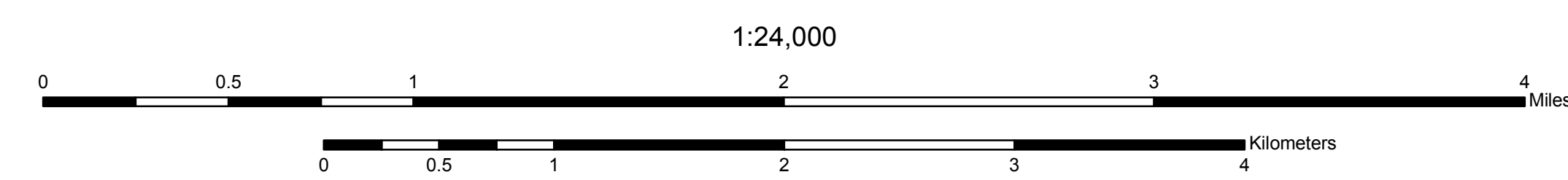
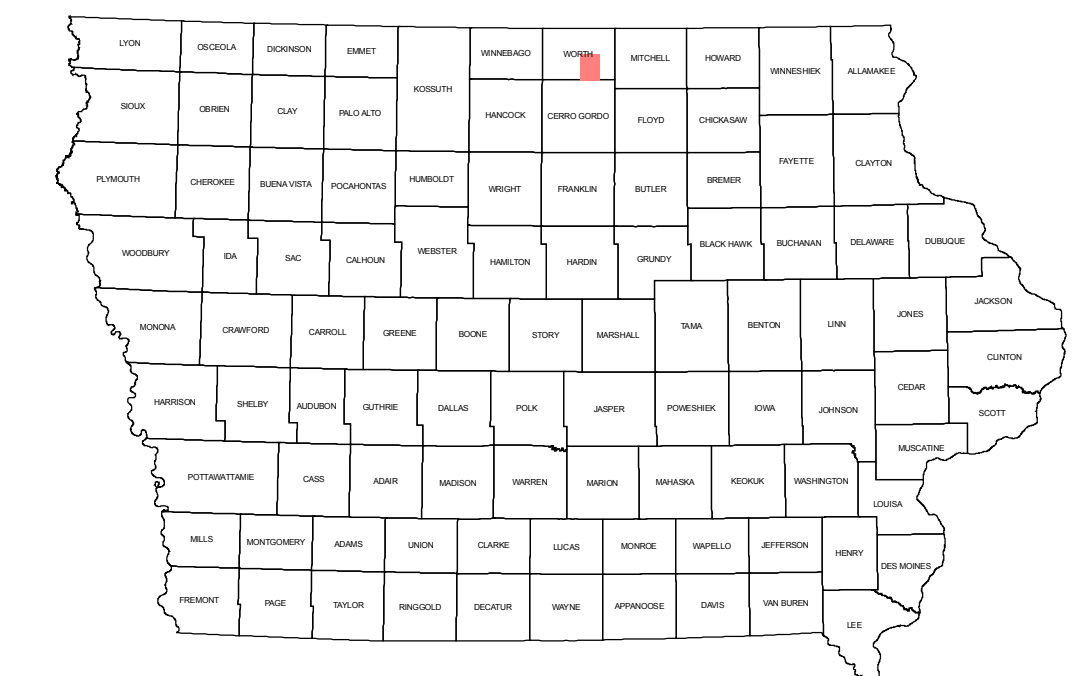
Correlation of Map Units



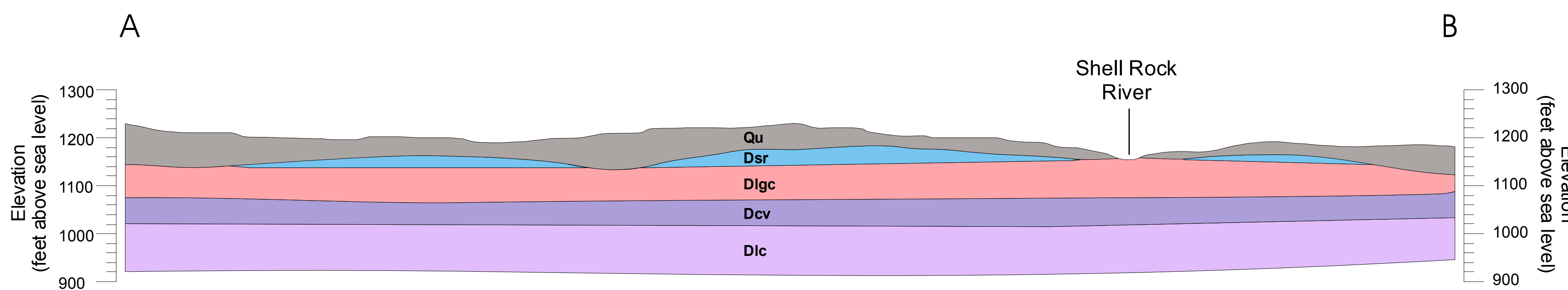
Adjacent 7.5' Quadrangles



Location Map



GEOLOGIC CROSS-SECTION A-B



Base map from USGS Manly 7.5' Digital Raster Graphic (IGS GIS file DRGC29.TIF) which was scanned from the Manly 7.5' Topographic Quadrangle map, published by US Geological Survey in 1972. Topographic contours and land features based on 1971 aerial photography, field checked in 1972. Land elevation contours (10' interval).

Iowa Geological Survey digital cartographic file Manly_BedrockGeology_2010, version 10/4/10 (ArcGIS 9.2). Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83.

The map and cross section 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.