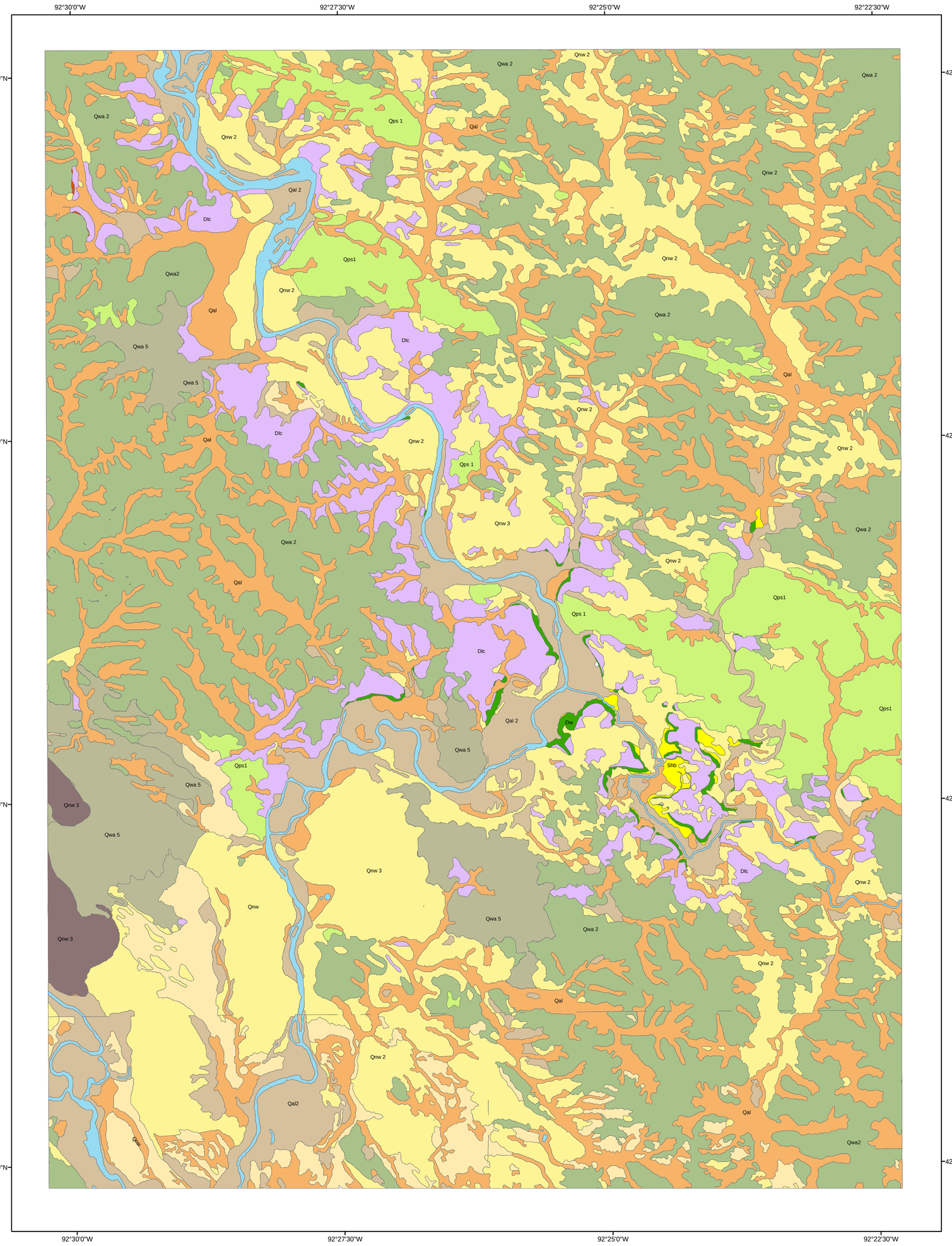
Surficial Geology of the Waverly (Iowa) 7.5’ Quadrangle



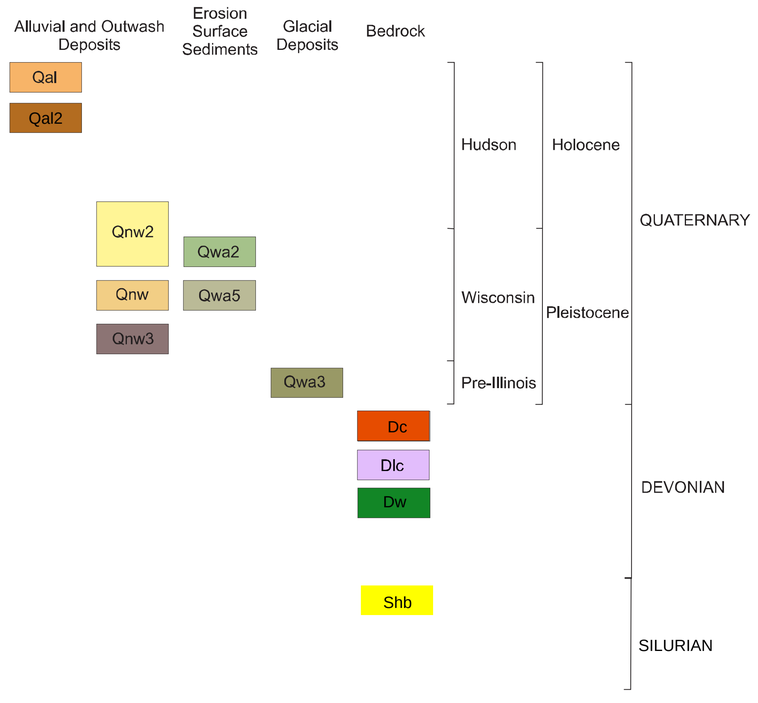
1:24,000

Miles

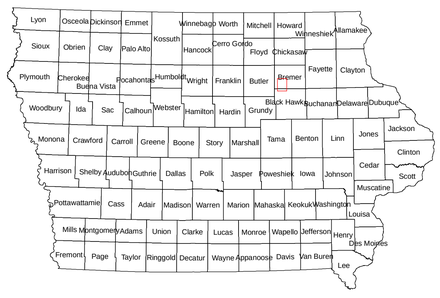
0 0.5 1 2 3 4

Kilometers

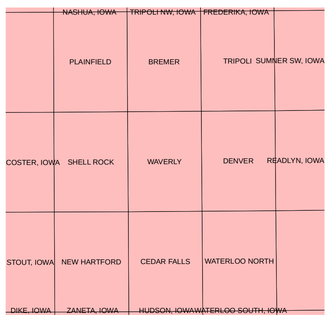
0 0.5 1 2 3 4



Quadrangle Location



Adjacent 7.5' Quadrangles



SURFICIAL GEOLOGIC MAP OF THE WAVERLY 1:24,000 QUADRANGLE

The University of Northern Iowa
Earth Science
July 2009

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LEGEND

Cenozoic

Quaternary System

Hudson Episode

Qal — **Qal - Alluvium** (DeForest Formation-Undifferentiated) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous to calcareous, massive to stratified silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hill slopes and in closed depressions. May overlie Noah Creek Formation, Wolf Creek or Alburnett formations or fractured Devonian carbonate bedrock. Associated with low-relief modern floodplain, closed depressions, modern drainage ways or toeslope positions on the landscape. Seasonal high water table and potential for frequent flooding.

Qal2 — **Qal2 - Stream Valley Thick Alluvium** (DeForest Formation - Undifferentiated) Generally 2 to 5 m of massive to moderately well stratified loam, silt loam, clay loam, or loamy sand overlying 5 to 25 m of poorly to moderately well sorted, massive to well stratified, coarse to fine feldspathic pebbly sand and gravel. High water tables occur in this map unit.

Hudson and Wisconsin Episode

Qnw2 — **Qnw2 – Sand and Gravel** (Noah Creek Formation) Generally 2 to 8 m (6-26 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine fledspathic quartz sand, pebbly sand and gravel with few intervening layers of silty clay. A thin mantle of loess, reworked loess or fine grained alluvium (Qal) may be present. This unit includes silty colluvial deposits derived from the adjacent map units. In places this unit is mantled with 1 to 3 m (3-10 ft) of fine to medium, well sorted sand derived from aeolian processes affecting adjacent alluvial deposits. This unit encompasses deposits that accumulated in low-relief stream valleys during the Wisconsin and Hudson Episodes. Seasonal high water table and some potential for flooding.

Wisconsin Episode

Qnw — **Qnw - Sand and Gravel** (Noah Creek Formation) - 3 m (10 ft) to more than 23 m (75 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. In places mantled with 1 to 3 m (3-10 ft) of fine to medium, well sorted sand derived from wind reworking of the alluvium. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode.

Qps1 — **Qps1 – Loess and Intercalated Eolian Sand** Generally 2 to 10 meters of yellowish brown to gray, massive, fractured, noncalcareous grading downward to calcareous silt loam and intercalated fine to medium, well sorted, sand. Strong lineation in a northwest-southeast direction, while occurring east of the Cedar River. The strong northwest-southeast orientation corresponds to the main paleocurrent wind direction during deposition.

Qnw3 — **Qnw3 – Sand and Gravel Shallow to Bedrock** (Noah Creek Formation) 1 to 3 m (3 to 10 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. May be overlain by up to 2 m (7 ft) of silty alluvial material. In places mantled with fine to medium well sorted feldspathic quartz sand derived from aeolian reworking of adjacent alluvial deposits. Fractured carbonate bedrock is less than 5 m (16 ft) below the land surface. The unit encompasses deposits that accumulated in river and stream valleys during the late Wisconsin as well as exhumed Pre-Illinoian Episode deposits of the Wolf Creek and Alburnett formations.

Qwa2 — **Qwa2 – Loamy and Sandy Sediment Shallow to Glacial Till** Generally 1 to 6 m of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment.

Qwa5 — **Qwa5 - Loamy and Sandy Sediment Shallow to Rock** (Unnamed erosion surface sediment) Generally 1 to 6 m (3-23 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria Formation deposits (loess and eolian sand). Eolian sand may lie directly on top of bedrock in isolated areas. Overlies fractured Devonian carbonate rocks. Seasonally high water table may occur in this map unit.

Paleozoic

Devonian, Silurian, and Ordovician System

Dc — **Dc - Bedrock Exposures** (Devonian Cedar Valley Group; Coralville Formation) Generally 45 meters (147 feet) thick; Primary lithologies - limestone and dolostone, fossiliferous to unfossiliferous, cherty in part, argillaceous in part; Secondary lithology -grey shale. Many near surface exposures of bedrock are present in the Waverly Quadrangle.

Dlc — **Dlc - Bedrock Exposures** (Devonian Cedar Valley Group; Little Cedar Formation) Generally 45 meters (147 feet) thick; Primary lithologies - limestone and dolostone, fossiliferous to unfossiliferous, cherty in part, argillaceous in part; Secondary lithology - grey shale. Few surface exposures of bedrock are present in the Waverly Quadrangle.

Dw — **Dw - Bedrock Exposure** (Deconian Wapsipinicon Group) Primary lithologies - dolostone, limestone, and shale.

Shb — **Shb - Bedrock Exposure** (Suilurian Hopkinton and Blanding formations) Maximum thickness - Hopkinton 160 ft (50 m); Blanding 65 ft (20 m). Primary lithologies - dolomite, fossil-moldic to vuggy, non-cherty to very cherty. Secondary lithologies - dolomite, chert, nodular to bedded (Blanding, lower Hopkinton).

Cedar River - primary and seconday channels

Base map from USGS Waverly 7.5” Digital Raster Graphic which was scanned from the Waverly 7.5” Topographic Quadrangle map, published by the United States Geological Survey in 19XX

Topographic contours and land features based on 1963 aerial photography, field checked in 1965

Land elevation contours (10’ interval) based on NGVD1929

Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83

The map is based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site specific studies.