

Surficial Geologic Materials of Hardin County, Iowa

SURFICIAL GEOLOGIC MAP OF THE DES MOINES LOBE OF IOWA Phase 8: Hardin County

Iowa Geological Survey
Open File Map OFM-06-6
July 2006

Prepared by
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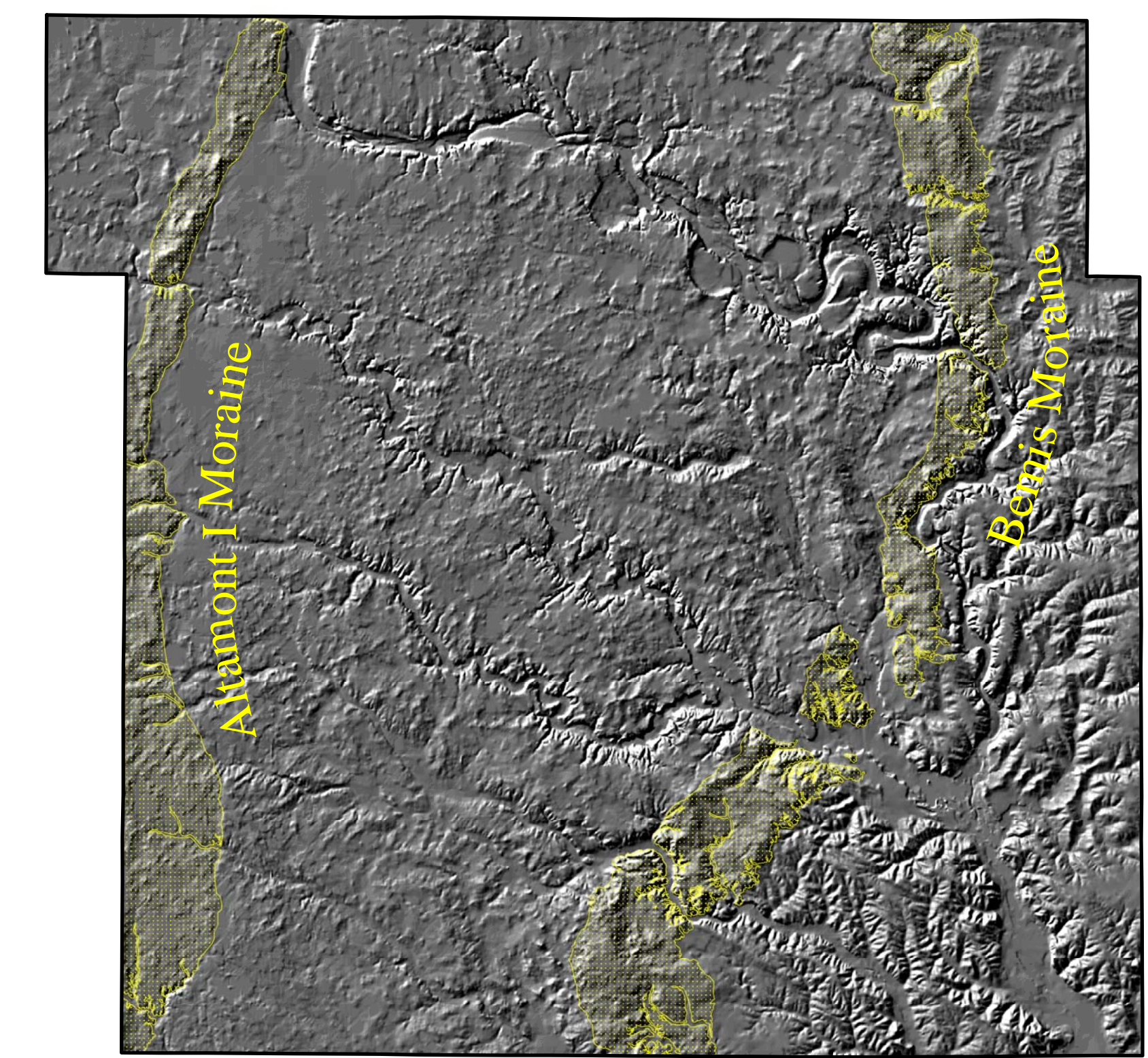
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ACKNOWLEDGEMENTS

Recognized for contributions to map's production: Ray Anderson, Bob Libra, Andrew Asell, Pete Kollasch, Heather Buresh, Katie Foreman, Mary Pat Heitman, and Lois Bair. Drilling was provided under a contract with Aquasolid of Iowa City, Iowa; a special thanks to Jay Jodyln and drilling crew members who worked at times in challenging drilling conditions. A special thanks to the following individuals who graciously allowed access to their land for drilling: Jeff Cook, Charles Crandall, Frank Dagli, Ron Galloway, Greg Gilbert, James Iger, James Handsaker, Keith Helvig, Mark Hobson, Lawrence and Allen Kadolph, Randy Madden, Henrietta Miller, Marvin Reifschneider, M. Schuneman and Ken Smith. Thank you to Dr. William Simpkins and graduate student Lucie MacLester of Iowa State University for their assistance in lining up drilling sites and assisting with coring. Also, we would like to recognize the efforts of the South Fork Watershed Alliance, National Tilth Laboratory, and USGS for their involvement in various hydrogeologic studies on the South Fork of the Iowa River in Hardin County.

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Shaded Relief Map of Hardin County



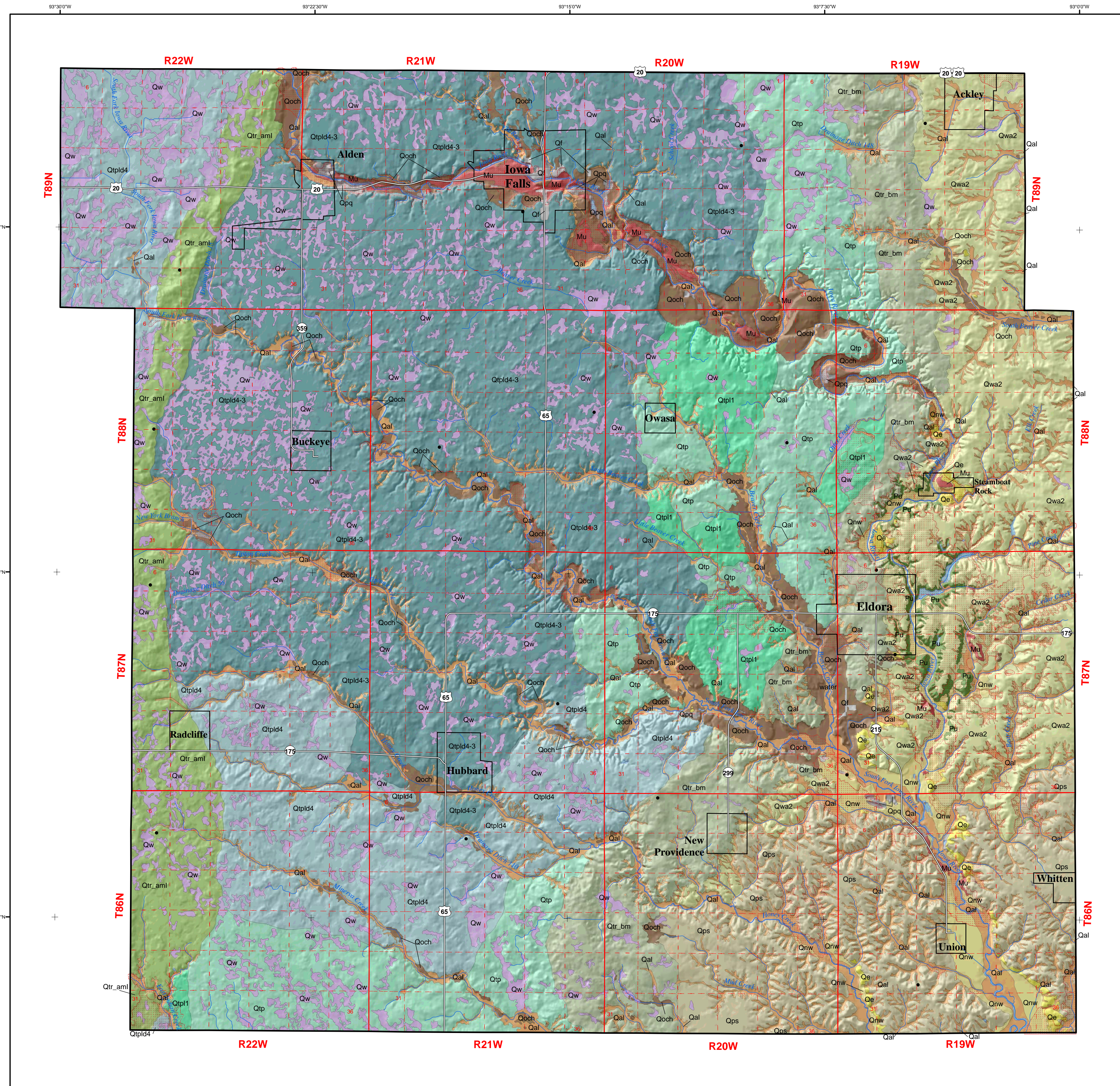
0 2.5 5 10 15 20 Miles

0 2.5 5 10 15 20 Kilometers

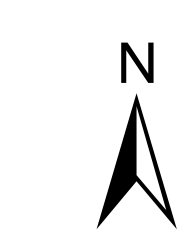
LEGEND

Description of Map Units

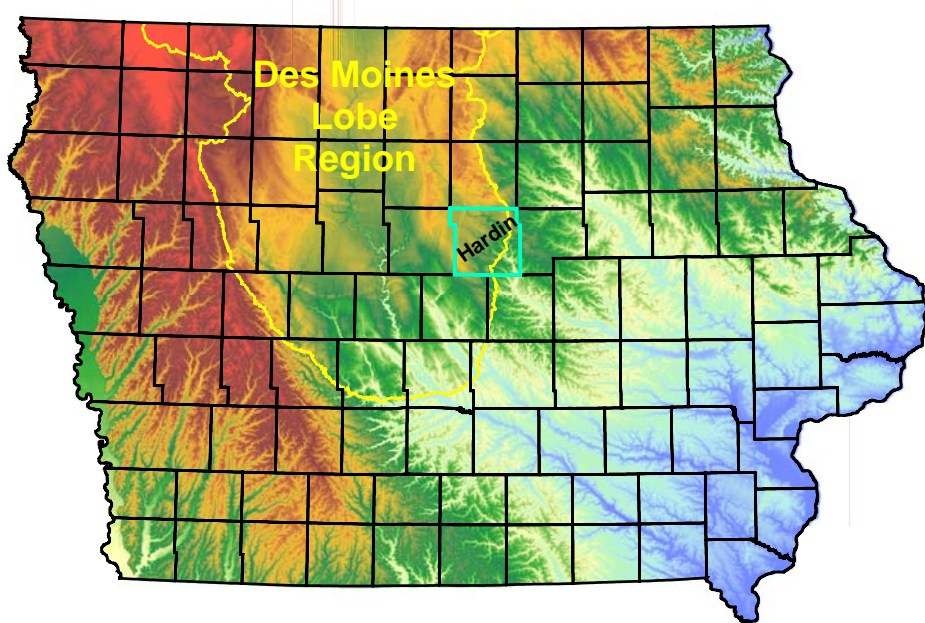
- Cenozoic**
- Quaternary System**
- Hudson Episode**
- Qv - Depressions (DeForest Formation-Woden Mbr.)** Generally 8 to 16.5 feet (2.5 to 5 meters) of black to very dark gray, calcareous, muck, peat and silty clay loam colluvium and organic sediments in drained and undrained closed and semi-closed depressions. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.) or Noah Creek Fin. sand and gravel. Associated with low relief features that occupy depressions and low sags on the landscape. Supports wetland vegetation and can be permanently covered by water. High water table.
- Qd1 - Alluvium (DeForest Formation-Undifferentiated)** Variable thickness 3 to 16.5 feet (<1 to 5 meters) of very dark gray to brown, micaceous to calcareous, 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 Dows Formation (Morgan or Alden Mbr.), or Noah Creek Formation diamictite. Off the Des Moines Lobe this unit overlies Pre-Illinoian diamictite. Associated with low-relief modern floodplain, closed depressions, modern drainways or oxbow positions on the landscape. Seasonal high water table and potential for frequent flooding.
- Wisconsin Episode**
- Qtr_2m - Till ridge (Dows Formation-Morgan Mbr.)** Generally 10 to 16.5 feet (3 to 5 meters) of yellowish to grayish brown, usually calcareous and fractured, stratified loam to silt loam; stratified sands and gravels to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 25 meters. This sediment package may overlie the Sheldon Creek Formation or Pre-Illinoian diamictite. Moderate to high relief hummocky landform features exceed 10 to 13 feet (3 to 4 meters) of local relief. This landform is characterized by moderate to high relief hummocks, and in places color and lane features. The surface pattern is primarily rounded irregularly-shaped patterns. This landform is associated with the Beets Moraine. The surface pattern is irregularly-shaped patterns. Seasonal high water table.
- Qtr_aml - Till ridge (Dows Formation-Morgan Mbr. or Pike Knob Mbr. or Lake Mills Mbr.)** Generally 29.5 to 50 feet (9 to 15 meters) of yellowish to grayish brown, usually calcareous and fractured, stratified loam to silt loam; stratified sands and gravels to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 25 meters. This sediment package may overlie the Sheldon Creek Formation or Pre-Illinoian diamictite. Moderate to high relief hummocky landform features exceed 10 to 13 feet (3 to 4 meters) of local relief. This landform is characterized by moderate to high relief hummocks, and in places color and lane features. The surface pattern is primarily rounded irregularly-shaped patterns. This landform is associated with the Beets Moraine. The surface pattern is irregularly-shaped patterns. Seasonal high water table.
- Qtr - Till plain (Dows Formation-Morgan Mbr.)** Less than 26 feet (8 meters) of yellowish brown, often calcareous and fractured, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). Low to moderate relief 10 to 26 feet (3 to 8 m), undulating plains with irregular surface patterns. Seasonal high water table.
- Qp1 - Aligned ridge to discontinuous elongated hummocky ridge form (Dows Formation-Morgan Mbr. or Pike Knob Mbr.)** Less than 26 feet (8 meters) of yellowish brown, calcareous, fractured, stratified sand and gravel with interbedded stratified loam diamictite or yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 15 to 20 meters and may overlie Sheldon Creek Formation or Pre-Illinoian diamictite. Low to moderate relief, less than 26 feet (8 meters) of local relief, slightly undulating plains with irregular surface patterns. **Aligned ridges to discontinuous elongated ridge forms** within the unit are underlain by less than 26 feet (8 meters) of yellowish brown, often calcareous, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Evidence of sheeting is sometimes present. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). Tracts of faint to distinct aligned ridges to elongated hummocks oriented transverse to glacier flow on the till plain with irregular shaped surface patterns. Ridges or aligned hummocks are low to moderate relief features 10 to 26 feet (3 to 8 meters). Overall landform exhibits swell and swale topography. Seasonal high water table.
- Qp1d - Till plain with linked depression systems and discontinuous elongated hummocky ridge form (Dows Formation-Morgan Mbr. or Pike Knob Mbr.)** Less than 26 feet (8 meters) of yellowish brown, calcareous, fractured, stratified sand and gravel with interbedded stratified loam diamictite or yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 50 to 65 feet (15 to 20 meters) and may overlie Sheldon Creek Formation or Pre-Illinoian diamictite. **Discontinuous elongated ridge forms** within the unit are underlain by less than 26 feet (8 meters) of yellowish brown, often calcareous, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). Tracts of faint to distinct aligned ridges to elongated hummocks oriented transverse to glacier flow on a very low relief till plain with reticulate linked-depression systems. Ridge forms are predominantly low relief <10 feet (<3 meters) features. Low to moderate relief 10 to 26 feet (3 to 8 meters) discontinuous isolated ridges that run oblique to glacier flow are common. Numerous medium to large depressions and small glacial and historic lake beds. Overall landform exhibits swell and swale topography. High water table.
- Qp1d-3 - Till plain with linked depression systems and aligned ridge forms to discontinuous elongated hummocky ridge form (Dows Formation-Morgan Mbr. or Pike Knob Mbr.)** Less than 26 feet (8 meters) of yellowish brown, calcareous, fractured, stratified sand and gravel with interbedded stratified loam diamictite or yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 40 to 65 feet (12 to 20 meters) and may overlie Sheldon Creek Formation or Pre-Illinoian diamictite. **Aligned ridge forms** within the unit are underlain by less than 26 feet (8 meters) of yellowish brown, often calcareous, stratified loam to silt loam to sandy loam diamictite; textures can be quite variable. Evidence of sheeting is sometimes present. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). Tracts of faint to distinct aligned ridges to elongated hummocks oriented transverse to glacier flow on a very low relief till plain with reticulate linked-depression systems. Ridges or aligned hummocks are low to moderate relief features 10 to 26 feet (3 to 8 meters). Numerous medium to large depressions and small glacial and historic lake beds. Overall landform exhibits swell and swale topography. High water table.
- Qvch - Valley train network (Noah Creek Formation)** Generally 26 to 50 feet (8 to 15 meters) of dark gray to brown, dark brown to dark yellowish brown medium to coarse sand, gravelly sand to pebbly gravel. Overlies gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). In valley positions, it is at the land surface of older terraces. On the modern floodplain it is buried by DeForest Fin. alluvium. Low-relief landforms expressed as broad terraces, long, narrow longitudinal terraces or oxbow-shaped point terraces. Terraces associated with the major valleys are bench on a gray, calcareous, massive, dense loam diamictite (Dows Fin-Alden Mbr.). This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode. No flooding potential, unless buried by DeForest Fin. on the modern floodplain.
- Qw - Sand and Gravel (Noah Creek Formation)** More than 10 feet (3 meters) 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 one to three meters of fine to medium, well sand derived from wind reworking of the alluvium. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode.
- Qp - Loess (Pocahontas Formation-silt facies)** Generally 6.5 to 13 ft (2 to 4 m) of yellowish to grayish brown, massive, pointed calcareous or micaceous silt loam to silty clay loam. Overlies a gray brown to olive gray silty clay loam to silty clay (Pugh Formation-rodol Farmdale Group) which is less than 5 feet (1.5 meters) thick. The Farmdale Group appears to be disturbed by periglacial action and is welded to an older Sangamon General developed in loess. This mapping unit encompasses upland divides, ridges and covers all-slopes. Well to somewhat poorly drained landscape.
- Qe - Sand Dunes and Sand Sheets (Pocahontas Formation-sand facies)** Generally less than 10 feet (3 meters) of yellowish brown, massive, calcareous loamy sand to fine sand. It may overlie yellowish-brown coarse grained sand and gravel (Noah Creek Fin.), or it may overlie yellowish to grayish brown, usually calcareous, stratified loam to silt loam to sandy loam diamictite (Dows Fin-Morgan Mbr.). Usually restricted to a narrow belt along major river valley bottoms or adjacent uplands on the Des Moines Lobe. Off the Des Moines Lobe this unit is not restricted to dunes along valley areas and may occur as sand strings overlying unsorted erosion surface loamy sediments.
- Qm2 - Loamy and Sandy Sediment Shallow to Glacial Till (Unsorted erosion surface sediment)** Three to six feet (1 to 3 meters) 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 15 ft (2 m) of Peoria Silt (loess). Overlies massive, fractured, firm Pre-Illinoian diamictite. Seasonally high water table may occur in this map unit.
- Paleozoic**
- Mt - Mississippian Bedrock Exposures (Gilemore City, Maynes Creek and Prospect Hill formations)** Lower Mississippian-Composed of marine limestone, dolomite, cherty dolomite, possibly some shale. Exposures present along the Iowa River valley from Alden through Eagle City area.
- Pu - Pennsylvanian Bedrock Exposures (Cherokee Group)** Middle Pennsylvanian-Primarily composed of detritic sediments associated with the Cherokee Group. Lithologies are extremely variable. Major lithologies consist of shale and sandstone with minor coal seams. Exposed along the Iowa River valley downstream from Steamboat Rock.
- Bedrock within 25 feet (7.6 meters) of land surface.**
- QF - Fill** Areas of major land filling. Fill associated with railroad grades, highway grades and land leveling. Variable in texture ranging from loamy to sandy to concrete rubble. Extent mapped as shown in county soil surveys.
- Qpq - Pits and Quarries** Sand and gravel pits and rock quarries. Extent mapped as shown in county soil surveys.
- Water Features**
- Drill Holes**



Scale 1:100,000



Location Diagram



Base map components from the Iowa DNR Natural Resource GIS Library (NRGIS)
100,000 scale Hardin County GIS files: PLSS42.shp and Rivers42.shp
Iowa statewide GIS files: Incorp.shp, Highway.shp and Township.shp
Shaded relief map derived from US Geological Survey 30 meter National Elevation Dataset (NRGIS file WED/hillshade)
Iowa Geological Survey digital cartographic file HardinCo06.mxd, version 6/29/06 (ArcGIS 9.0)
Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83

Adjacent Iowa Counties

