

**SURFICIAL GEOLOGIC MAP
OF THE DES MOINES LOBE OF IOWA
Phase 4: Dallas County**

Iowa Geological Survey
Open File Map 2002-2
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Environmental Services Division
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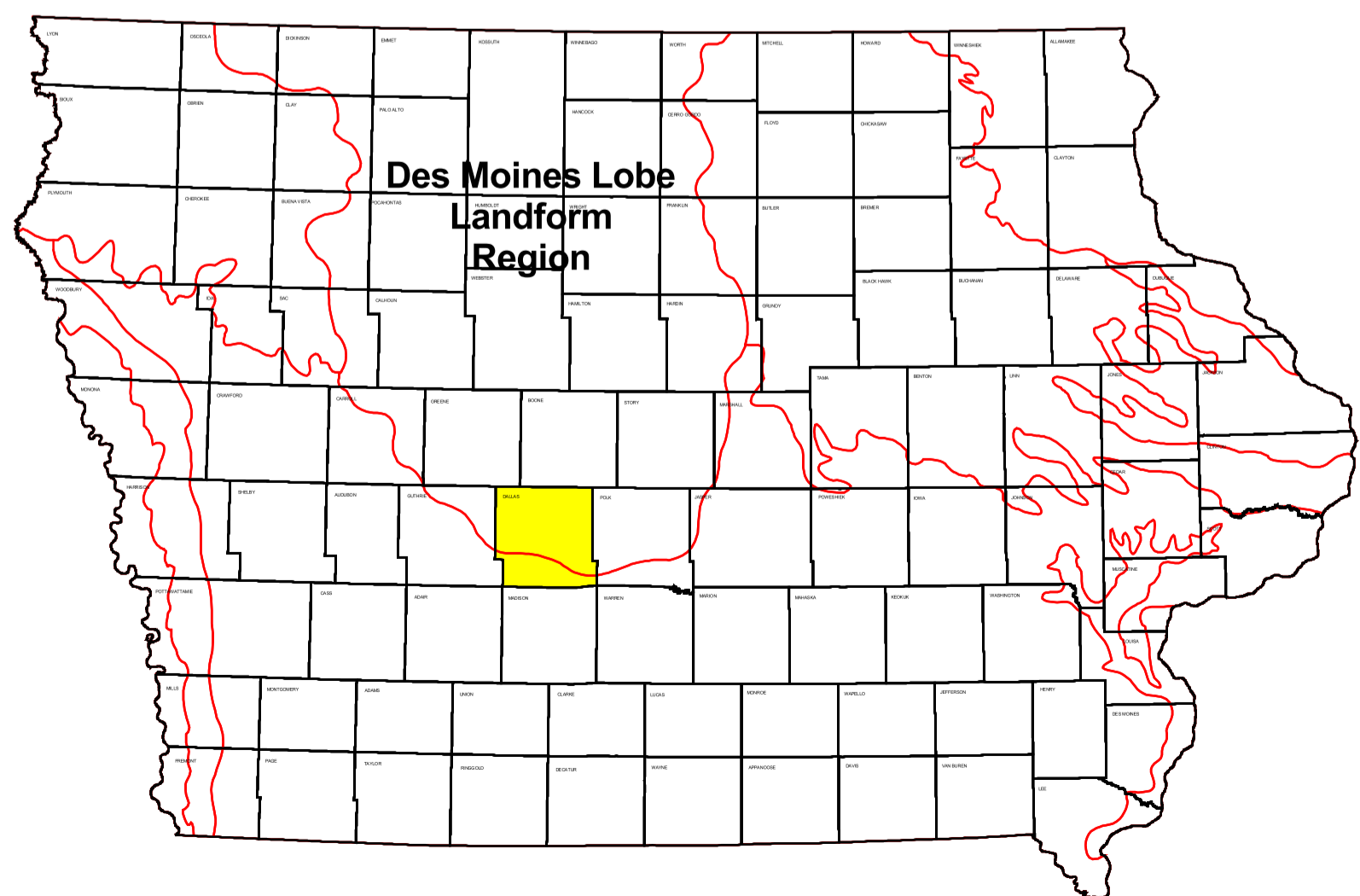
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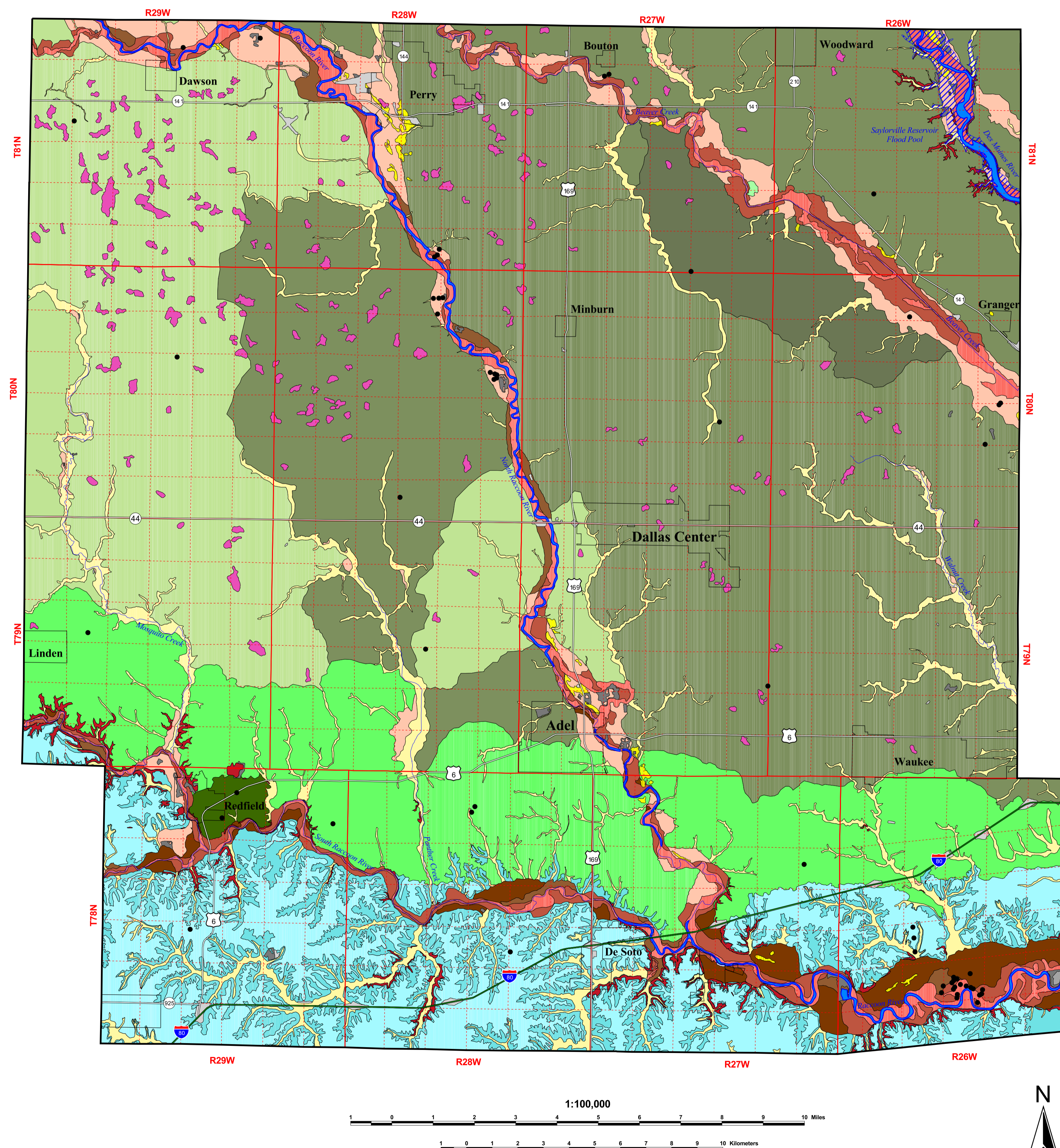
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LOCATION MAP



Surficial Geologic Materials of Dallas County, Iowa



LEGEND

Description of Mapping Units

Hudson Episode

- Qo - Depressions** (DeForest Formation-Woden Mbr.) Generally 2.5 to 6 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 diamicton (Dows Fm.- Alden Mbr.) or Noah Creek Fm. 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.
- Qal - Alluvium** (DeForest Formation-Undifferentiated) Variable thickness less than 1 to 5 meters of a very dark gray to brown, noncalcareous to calcareous, stratified silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hillsides and in closed depressions. May overlie Dows Formation (Morgan or Alden Mbrs.), Noah Creek Formation, or Pennsylvanian bedrock. Associated with low-relief modern floodplain, closed depressions, modern drainage ways or toe slope positions on the landscape. Seasonal high water table and potential for frequent flooding.
- Qallt - North and South Raccoon River, Des Moines River and Beaver Creek Valley - Low Terrace** (DeForest Formation-Camp Creek Mbr. and Roberts Creek Mbr.) Variable thickness of less than 1 to 5 meters of very dark gray to brown, noncalcareous, stratified silty clay loam, or clay loam, associated with the modern channel belt of the Des Moines River valley. Overlies Noah Creek Formation. Occupies lowest position on the floodplain i.e. modern channel belts. Seasonal high water table and frequent flooding potential.
- Qallt - North and South Raccoon River, Des Moines River and Beaver Creek Valley - Intermediate Terrace** (DeForest Formation-Camp Creek Mbr., Roberts Mbr. and Gunder Mbr.) Variable thickness of less than 1 to 5 meters of very dark gray to brown, noncalcareous, stratified silty clay loam to loam that overlies Noah Creek Formation. Occupies low terrace position. Seasonal high water table and frequent flooding potential.
- Qallt - North and South Raccoon River, Des Moines River and Beaver Creek Valley - Intermediate-High Terrace** (DeForest Formation-Gunder Mbr.) Variable thickness of less than 1 to 5 meters of very dark gray to brown, noncalcareous, silty clay loam to loam alluvium or colluvium that overlies Noah Creek Formation. Occupies terrace and valley margin position 1 to 2 meters above the modern floodplain. Seasonal high water table and low to moderate flooding potential.
- Qallt - North and South Raccoon River, Des Moines River and Beaver Creek Valley - High Terrace** (DeForest Formation-Gunder and Corrington Mbrs.) Variable thickness of less than 1 to 7 meters of very dark gray to brown, noncalcareous, silty clay loam, loam alluvium or colluvium. Overlies Noah Creek Formation. Occupies terrace and valley margin position 2 to 3 meters above the modern floodplain. Seasonal high water table and rare flooding potential.

Wisconsin Episode

- Qe - Sand Dunes and Sand Sheets** (Peoria Formation-sand facies) Generally less than 3 meters of yellowish brown, massive, calcareous loamy sand to fine sand. It may overlie yellowish-brown coarse-grained sand and gravel (Noah Creek Fm.), or it may overlie yellowish to grayish brown, usually calcareous, stratified loam to silt loam to sandy loam diamicton (Dows Fm.-Morgan Mbr.). Usually restricted to a narrow belt along major river valley bottoms or adjacent uplands on the Des Moines Lobe.
- Qps1 - Loess** (Peoria Formation-silt facies) Generally 2 to 4 meters of yellowish to grayish brown, massive, jointed calcareous or noncalcareous silt loam to silty clay loam. Overlies a grayish brown to olive gray silty clay loam to silty clay (Pisgah Formation-eroded Farmdale Geosol) which is less than 1.5 meters thick. The Farmdale Geosol appears to be disturbed by periglacial action and is welded to an older Sangamon Geosol developed in loess. This mapping unit encompasses upland divides, ridge tops and convex side slopes. Well to somewhat poorly drained landscape.
- Qpl - Till Plain with discontinuous elongated hummocky ridge forms** (Dows Formation-Morgan Mbr.) Less than 4 meters of yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.- Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 30 meters and may overlie Peoria Formation-silt facies, Pisgah Formation-Farmdale Geosol or Pre-Illinoian diamicton. Low relief, (less than 3 meters of local relief), slightly undulating plains with irregular surface patterns. **Discontinuous elongated ridge forms** within the unit by less than 8 meters of yellowish brown, often calcareous, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). Indistinct elongated hummocks are oriented transverse to glacier flow on the till plain with irregular shaped surface patterns. Ridges are predominately low relief (less than 3 meters) with some moderate relief features (3 to 8 meters). Overall landform exhibits swell and swale topography. Seasonal high water table.
- Qpl1 - Aligned ridge to discontinuous elongated hummocky ridge forms** (Dows Formation-Morgan Mbr./Pilot Knob Mbr.) Less than 8 meters of yellowish brown, calcareous, fractured, stratified sand and gravel with interbedded stratified loam diamicton or yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. In depressions and sags on upland surfaces, DeForest Fm.-Woden Mbr may bury the sand and gravel. The Alden Mbr. in this mapping unit can extend to depths in excess of 30 meters and may overlie Peoria Formation-silt facies, Pisgah Formation - Farmdale Geosol or Pre-Illinoian diamicton. Low to moderate relief, (less than 8 meters of local relief), slightly undulating plains with irregular surface patterns. **Aligned ridges to discontinuous elongated ridge forms** within the unit by less than 8 meters of yellowish brown, often calcareous, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. Evidence of shearing is sometimes present. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). Along the western margin of Beaver Creek, these elongated hummocks consist primarily of sand and gravel and exhibit evidence of syndepositional collapse (Pilot Knob Mbr.). Tracts of faint to distinct aligned ridges to elongated hummocks oriented transverse to glacier flow are prevalent across the till plain. Ridges or aligned hummocks are low to moderate relief features (3 to 8+ meters). Overall landform exhibits swell and swale topography. Seasonal high water table.
- Qpl3 - Aligned ridge forms** (Dows Formation-Morgan Mbr.) Less than 8 meters of yellowish to grayish brown, calcareous, fractured, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 30 meters and may overlie Peoria Formation-silt facies, Pisgah Formation - Farmdale Geosol or Pre-Illinoian diamicton. Tracts of distinct to well-defined aligned hummocks oriented transverse to glacier flow. Aligned ridges are moderate to high relief features (3 to 8+ meters). Moderate to high relief (3 to 8+ meters) on aligned hummocks. Overall landform exhibits lined ridge pattern rather than hummocky swell and swale topography. Seasonal high water table.
- Qtr - Till ridge** (Dows Formation-Pilot Knob Mbr./Morgan Mbr.) Generally 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 diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). The Alden Mbr. in this mapping unit can extend to depths in excess of 15 meters and may overlie Peoria Formation-silt facies, Pisgah Formation - Farmdale Geosol or Pre-Illinoian diamicton. Moderate to high relief hummocky landform features exceed 3 to 8 meters of local relief. This landform is associated with the Bemis Moraine in Dallas County. Seasonal high water table.
- Qtpob - Till Plain/Buried Outwash fan** (Dows Formation/Noah Creek Formation) Less than 2 to 3 meters of yellowish brown, often calcareous and fractured, stratified loam to silt loam to sandy loam diamicton; textures can be quite variable. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). The Alden Mbr. in this mapping unit extends to a depth of 4 meters and overlies 8 to 10 meters of yellowish brown to greenish gray coarse-grained sand and gravel (Noah Creek Formation: buried). Overlies greenish gray Pennsylvanian-age shale, most likely Marmaton Group. Low relief, (less than 2 meters of local relief), bench-like feature. The buried fan appears to be an isolated feature located at the toe of the Bemis Moraine. No flooding potential.
- Qoch - Valley train outwash** (Noah Creek Formation) Generally 3 to 15 meters of yellowish brown coarse-grained sand and gravel. Overlies gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). In valley positions, it is at the land surface of older terraces. On the modern floodplain it is buried by DeForest Fm. alluvium. Low-relief landforms expressed as broad terraces; long, narrow longitudinal terraces or cusped-shaped point terraces. Outwash terraces associated with the major valleys are predominately benched on a gray, calcareous, massive, dense loam diamicton (Dows Fm.-Alden Mbr.). A few are benched on Pennsylvanian bedrock. Primary lithologies are shale, limestone, sandstone and mudstone units associated with the Cherokee, Marmaton and Bronson Groups. No flooding potential.

Pre-Illinois Episode

- Qwa3 - Till** (Wolf Creek or Alburnett Formations) Generally 10 to 35 meters of very dense, massive, fractured, loamy glacial till of the Wolf Creek or Alburnett Formations with or without a thin loess mantle (Peoria Formation - less than 2 meters) and intervening clayey Farmdale/Sangamon Geosol. This mapping unit encompasses narrowly dissected interfluvial and side slopes, and side valley slopes. Drainage is variable from well drained to poorly drained.

Paleozoic

- Pa - Pennsylvanian Bedrock Exposures** (Cherokee, Marmaton and Bronson Groups) Upper to Middle Pennsylvanian--Primarily light to dark gray shale, fossiliferous limestone, light gray to red mudstone and very fine to medium sandstone.
- Qpq - Pits and Quarries** Sand and gravel pits and rock quarries. Extent mapped as shown in county soil surveys.
- 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.
- Water Features**
- Drill Hole Locations**