Surficial Geologic Map of the Charles City (Iowa) 7.5' Quadrangle

Introduction to the Surficial Geology Map of the Charles City 7.5’ Quadrangle, Floyd County, Iowa

The Charles City 7.5’ Quadrangle is located within the Wisconsin age basin of the Cedar Valley Group in eastern Iowa. During the early Wisconsin age, the Cedar Valley Group was deposited in a rift basin and consists of two major units, the Eolian and Alluvial Shallow to Bedrock units. The Eolian unit is represented by the Loamy Sediments Shallow to Glacial Till unit, which is composed of fine-grained sediments, while the Alluvium Shallow to Bedrock unit consists of coarser sediments such as sand and gravel. The Eolian unit overlies the Alluvium Shallow to Bedrock unit in many areas. The map shows the distribution and thickness of these units across the quadrangle. The map also highlights the presence of erosion surfaces, such as the Noah Creek Formation and the Alburnett Formation, and provides information about the geologic features such as sand dunes and sand sheets. The map includes a geologic cross-section that shows the vertical relationships of the units and the location of the cross-section is indicated on the map.

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Surficial Geology of the Cedar Valley Group:

The Cedar Valley Group consists of several units, including:

- **Loamy Sediments Shallow to Glacial Till (Qsc2)**:
  - Generally 5 to 15 m (16-49 ft), but there may be significantly thinner coarse-grained deposits in smaller areas.
  - Found in the northern part of the quadrangle.

- **Alluvium Shallow to Bedrock (Qalb)**:
  - Includes deposits that accumulated in closed depressions. May overlie the Noah Creek Formation or Devonian carbonate bedrock. Bedrock surface is within 5 m (16 ft) of the land surface.

- **Noah Creek Formation (Qnw2)**:
  - Generally 5 to 15 m (16-49 ft), but there may be significantly thinner coarse-grained deposits in smaller areas.
  - Found in the southern part of the quadrangle.

- **Empire County Coil (Qem)**:
  - 1 to 3 m (3-10 ft) of yellowish brown to gray, poorly to well sorted, massive to blocky glacial till.
  - Found in the central part of the quadrangle.

Geologic Features:

- **Erosion Surfaces**:
  - Present in the quadrangle, with some areas showing evidence of glacial scouring and deposition.

- **Sand Dunes and Sand Sheets**:
  - Formed during the late Wisconsin age, with dunes and sheets present in various parts of the quadrangle.

- **Sand and Gravel Pits and Rock Quarries**:
  - Extent mapped as shown on the county soil survey and as identified on aerial imagery.

References:


The map is supported by various geological and environmental studies conducted in the region, providing a comprehensive view of the surficial geology and its implications.