

### DESCRIPTION OF MAP UNITS

The map emphasizes the origin of surficial materials in the area of the Jordan East 7.5-minute quadrangle. It was constructed in part using aerial photographs taken in 1968 and 1977 (1:80,000 scale) and in 1991 (1:40,000 scale), and U.S. Soil Conservation Service soil-survey maps for Scott County (Harms, 1955).

Field work was conducted during the summer of 1997 and the spring of 1998. Most exposures consisted of excavations, including construction sites, road cuts, and gravel pits. Surface samples were supplemented with soil borings drilled to a depth of about 20 feet (6 meters).

#### PALUSTRINE DEPOSITS

**Qo** **Organic deposits (Holocene)**—Palustrine sediments consisting of dark-brown to black, drained and undrained peat and muck. In the floodplain, this unit may also contain overbank and slackwater sediments.

**Qc** **SLOPEWASH DEPOSITS**  
**Colluvial deposits (Holocene)**—Reworked sediments consisting of a friable mixture of sand, silt, clay, and pebbles; resembles till and sand and gravel from which it is derived; may contain disseminated organic debris. Unit includes the till that forms steep bluffs, sediment that accumulates at the base of steep slopes, and sediment that is deposited along small streams in deep gullies.

**Qa** **Alluvial fan deposits (Holocene)**—Slopewash sediments consisting of loam to loamy sand; beds of silt loam to silty clay loam, fine sand, and gravel; disseminated organic debris. Deposited in floodplain at the base of steep slopes and at the mouths of deep gullies. Forms apron of sediment 4–20 feet (1–6 meters) thick over terrace and floodplain deposits.

#### FLUVIAL DEPOSITS

**Qf** **Alluvium of the Minnesota River (Holocene)**—River-channel, overbank, and slackwater sediments consisting of dark-brown to olive-yellow sandy clay loam to sandy loam; contains sand and gravel. Amount of sand and gravel increases adjacent to river channel and in areas of channel migration (scroll bars). Organic debris is both disseminated in the sediments and forms discrete peat beds in places.

**Qts** **Alluvium along small streams (Holocene)**—Creek-channel, overbank, and slackwater sediments consisting of dark-grayish-brown to olive-yellow sandy clay loam to sandy loam; layers of fine sand and gravel. May contain organic debris, both disseminated in the sediments and in discrete peat beds in places. Deposited along Sand Creek in the southwestern corner of the map area. Sand Creek flows on a relatively wide floodplain in a steep-walled valley that is aggrading to the rising baselevel of the Minnesota River. Ice contact deposits that flank the stream valley suggest that the current stream course follows a former outwash stream.

**Alluvial terrace deposits**—Sediments of Glacial River Warren preserved as terraces above the floodplain of the modern Minnesota River.

**Qft1** **Alluvium of terrace 1 (Holocene and Pleistocene)**—Variable thickness of predominantly medium to coarse sand; contains less than 20 percent gravel; very coarse sand fraction contains less than 10 percent shale. Terrace elevation about 750 feet—40 feet (12 meters) above present floodplain.

**Qth** **Ice-contact deposits (Pleistocene)**—Mixed sediments, the overall texture of which is predominantly silt loam to sand; consists of layers of sorted sediments (silt, sand, and gravel) and unsorted sediments (till, cobbles, boulders); collapsed, hummocky topography. Deposited by meltwater streams on top of ice. Mined in places for sand and gravel or construction fill.

#### MASS-MOVEMENT DEPOSITS

**Qthh** **Slumped deposits (Holocene)**—Glacial till consisting of unsorted pebbles, cobbles, and boulders in a matrix of loam to clay loam; similar in texture and composition to till of map unit Qth; forms linear ridges and valleys interpreted to be slump blocks; 10–30 feet (3–9 meters) of relief. Older slump blocks that lack the distinctive ridge-and-valley topography may be present in mapped area but are unrecognized. Slumping may have occurred when Glacial River Warren filled the valley and undercut the valley wall in this area.

#### GLACIAL DEPOSITS

Sediment deposited by the northwest-southwest Des Moines-lobe ice. Deposits contain gray siliceous shale fragments. Color of till is variable but is typically yellow-brown to gray-brown where oxidized. All till deposits are interpreted as supraglacial in origin. Distinctions are made, in part, based on the degree of collapse.

**Till (Pleistocene)**—Unsorted sediment consisting of abundant pebbles, common cobbles, and rare boulders in a matrix of loam to clay loam; pockets of silt, sand, and gravel in places. Average composition of the very coarse sand fraction includes crystalline rocks (42 ± 6 percent), carbonate rocks (25 ± 4 percent), and shale fragments (33 ± 7 percent).

**High-relief deposits**—Till as above; deposits form conical, rounded or elliptical hills; overall relief about 40–70 feet (12–22 meters).

**Collapsed deposits**—Till as above; hummocky, irregular topography; relatively low relief (20–30 feet or 6–9 meters); many collapsed channels.

**Sandy till (Pleistocene)**—Unsorted sediment consisting of abundant pebbles, common cobbles, and rare boulders in a matrix of loam to sandy loam; pockets of silt, sand, and gravel in places. Average composition of the very coarse sand fraction includes crystalline rocks (65 ± 6 percent), carbonate rocks (25 ± 3 percent), and shale fragments (10 ± 5 percent). Unit is overlain in places by a discontinuous veneer of sand and gravel.

**Collapsed, high-relief deposits**—Till as above; forms island-like highlands 50–70 feet (15–20 meters) above low-relief, hummocky terrain; overlain in places with a discontinuous veneer of silt loam.

**Qthl** **Collapsed, low-relief deposits**—Till as above; hummocky, irregular topography; relatively low relief (20–30 feet or 6–9 meters); overlain in places with a discontinuous veneer of sand and gravel.

**Qthc** **Clayey till (Pleistocene)**—Unsorted sediment consisting of abundant pebbles, common cobbles, and rare boulders in a matrix of clay to clay loam; pockets of silt, sand, and gravel in places. Average composition of the very coarse

### DESCRIPTION OF MAP SYMBOLS

**Contact**—Dashed where approximate. Established from aerial photographs, geomorphology, soil maps, and examination of surficial material.

**Scarp**—Ticks point down scarp; dashed where discontinuous or obscure. Marks former channel or ice-contact position.

**Elongate ridge**—Interpreted to be an esker or eskerlike ridge consisting of sand and gravel (esker) or unsorted debris (sand, gravel, and till crevasse fill); may be covered by till. Eskers are formed by streams that flowed beneath, within, or on top of stagnant ice.

**Alluvial fan**—Indicates area where fan morphology is distinct.

**Scroll bars**—Indicates migration of river channel; may be slightly elevated; surface composed of loam to medium sand. Symbol is schematic representation; individual bars not mapped.

**Linear feature**—Identified from aerial photographs. Symbol schematically represents the ridge-and-valley topography of slump blocks within map unit Qth.

**Pits (sand and gravel or crushed rock)**—Active; inactive. Where applicable, areal extent indicated by outline.

**Soil boring**—Auger depth, 3–26 feet (1–8 meters).

**Sample location**—Includes outcrops and artificial exposures (construction sites and gravel pits).

**Record of water-well construction**—Location of water well for which there is a log prepared by a well driller. The information on the log is interpreted by a geologist and the location of the well verified. There are 391 well records for the Jordan East quadrangle.

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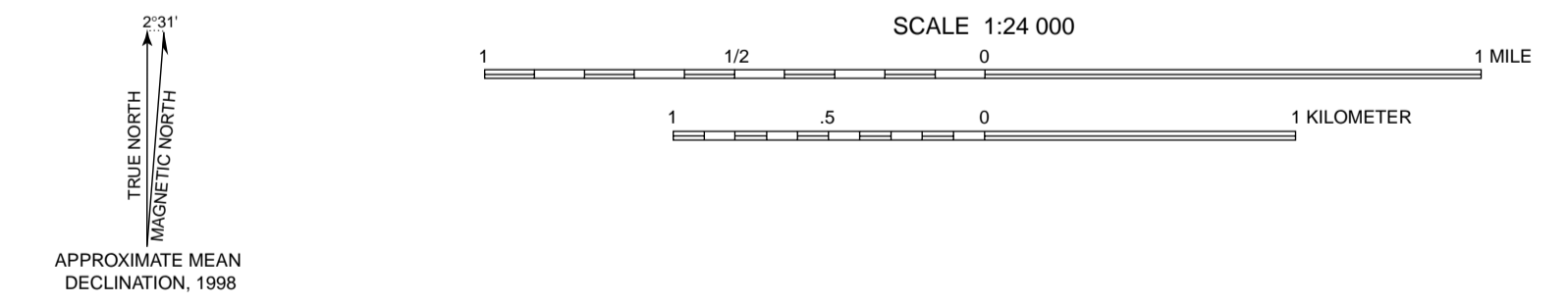
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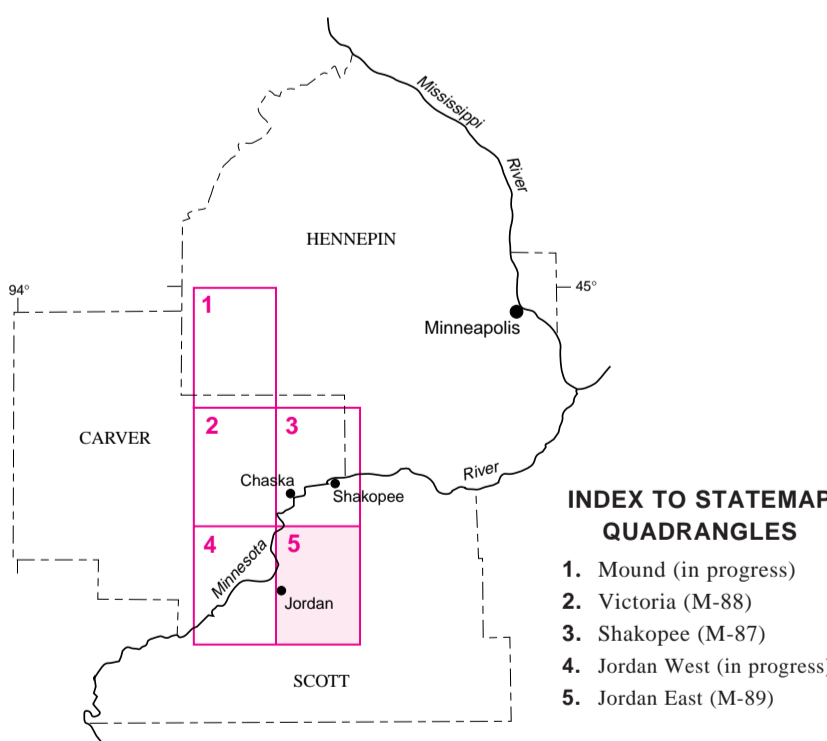
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Every reasonable effort has been made to ensure the accuracy of the factual data on which this map interpretation is based; however, the Minnesota Geological Survey does not warrant or guarantee that there are no errors. Users may wish to verify critical information; sources include both the references listed here and information on file at the offices of the Minnesota Geological Survey in St. Paul. In addition, effort has been made to ensure that the interpretation conforms to sound geologic and cartographic principles. No claim is made that the interpretation shown is rigorously correct, however, and it should not be used to guide engineering-scale decisions without site-specific verification.

Base modified from U.S. Geological Survey, 1981  
Lambert conformal conic  
1927 North American Datum (NAD 11)



GIS compilation and cartography  
by Joyce Meints and Phil Heywood



## SURFICIAL GEOLOGIC MAP OF THE JORDAN EAST QUADRANGLE, CARVER AND SCOTT COUNTIES, MINNESOTA

By  
Barbara A. Lusardi  
1998