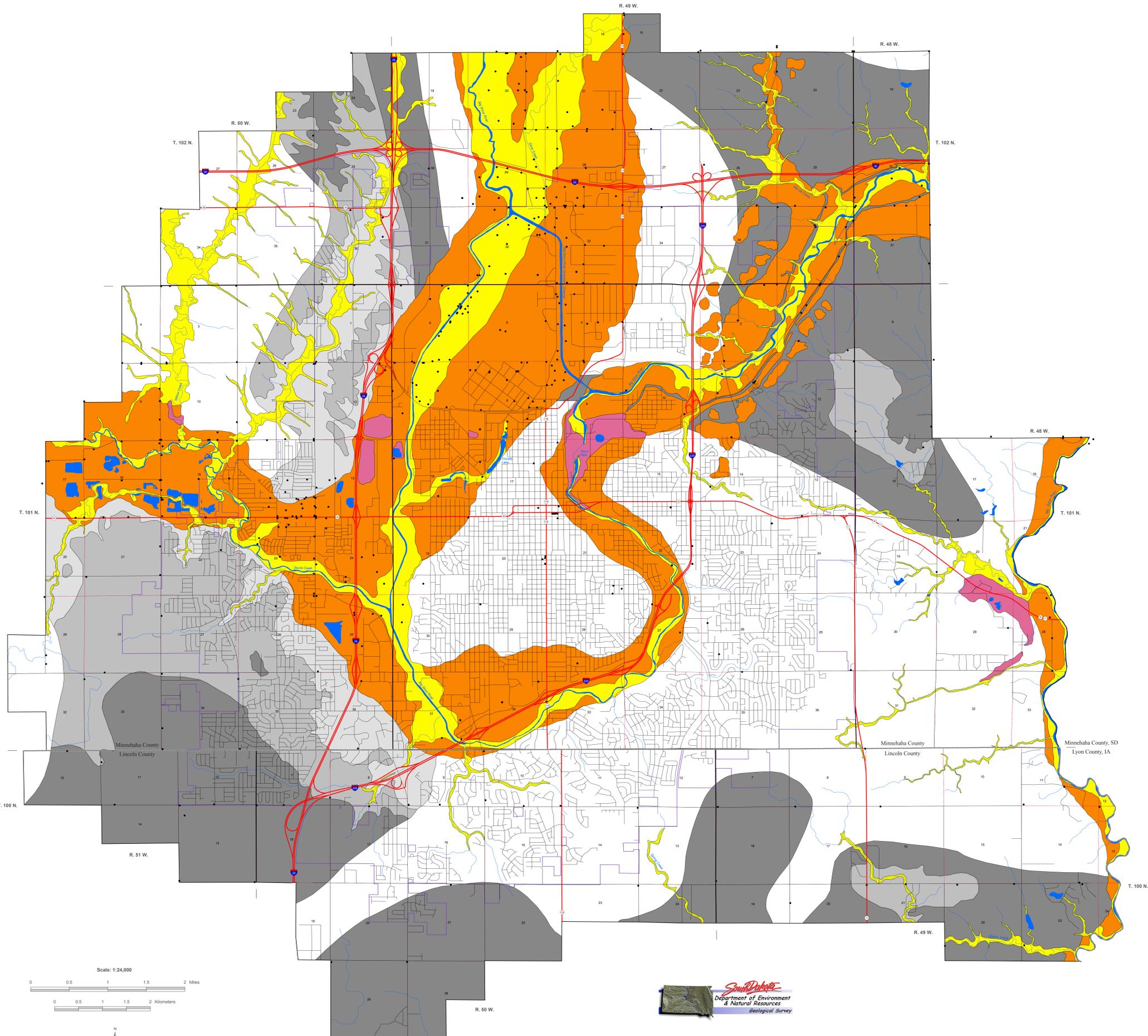


First Occurrence of Aquifer Materials in the Sioux Falls, South Dakota, Metropolitan Growth Area

State of South Dakota
M. Michael Rounds, Governor

South Dakota Geological Survey
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Department of Environment and Natural Resources
Division of Financial and Technical Assistance
Geological Survey
Aquifer Materials Map 23
Dennis W. Tomhave, 2006



Explanation

This map is intended for use as a tool to aid in identifying areas underlain by aquifer material. The aquifer materials shown on this map are categorized below. This map does not show individual aquifers. There may be more than one type of aquifer material present in an area. However, only the aquifer material that would be first encountered is shown. Within the boundaries of any given map unit, there may be localized areas where aquifer material is absent. The thickness and permeability of aquifer material may vary significantly. Also, no attempt was made to distinguish between saturated and unsaturated material. Therefore, not all of the areas defined on this map may be an aquifer. Site-specific information should always be examined when making land management or water development decisions.

- Alluvium:** Consists of clay and silt with minor amounts of sand and gravel that, in some cases may directly overlie a major aquifer.
 - Sand and Gravel:** First occurrence is generally at land surface.
 - Sand and Gravel:** First occurrence is generally below land surface. May not be uniform in depth and thickness and may be discontinuous in lateral extent.
 - Sioux Quartzite:** First occurrence is generally at land surface. The Sioux Quartzite consists of predominantly orthoquartzite with minor conglomerate, sandstone, and mudstone (Pipestone) layers. The orthoquartzite portion of the formation, typically pale red in color, consists predominantly of fine grains of quartz sand cemented together by silica. The Sioux Quartzite is broken into blocks by well developed fracturing, both vertical and horizontal. The Sioux Quartzite is generally not an aquifer material, however, locally it yields water from fractures or porous zones.
- First occurrence is generally less than or equal to 50 feet below land surface**
- Sand and Gravel:** May not be uniform in depth and thickness and may be discontinuous in lateral extent.
- First occurrence is generally greater than 50 feet and less than or equal to 100 feet below land surface**
- Sand and Gravel:** May not be uniform in depth and thickness and may be discontinuous in lateral extent. Minor occurrences of aquifer material may be encountered less than 100 feet below land surface.
- Area where continuous aquifer material has not been mapped between the land surface and Sioux Quartzite. Sioux Quartzite occurs from near land surface to greater than 300 feet below land surface. The Sioux Quartzite is generally not an aquifer material, however, locally it yields water from fractures or porous zones. Within this area aquifer material may exist.

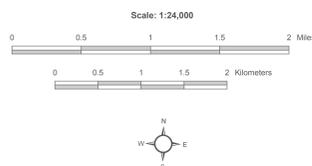
- Data Point - used for construction of map
- County boundary
- Sioux Falls city boundary
- Township boundary
- Section boundary
- Major highway
- Road or street
- River or stream
- Lake
- Slough or intermittent lake

This map was developed from lithologic logs and published reports. The major sources of information were:

- Filipovic, D., and Pence, S.F., 2001, *The Wall Lake aquifer study*: South Dakota Geological Survey Open-File Report 88-UR, 69 p.
- Lindgren, R., and Nicholas, C.A., 1992, *Water resources of Minnehaha County, South Dakota*: U.S. Geological Survey Water Resources Investigations Report 91-4101, 80 p.
- Pence, S.F., 1997, *Summary of the Split Rock Creek aquifer study*: South Dakota Geological Survey Open-File Report 87-UR, 169 p.
- South Dakota Geological Survey, Lithologic logs database.
- Tomhave, D.W., 1994, *Geology of Minnehaha County, South Dakota*: South Dakota Geological Survey Bulletin 37, 53 p.
- 2001, *First occurrence of aquifer materials in Minnehaha County, South Dakota*: South Dakota Geological Survey Aquifer Materials Map 9, scale 1:100,000.

The Geological Survey, Department of Environment and Natural Resources, engages in an ongoing data collection and interpretation process. An outcome of that process is to reflect those interpretations on maps such as this one. Reasonable efforts have been made to ensure that this map accurately reflects the source data used in its preparation. This map is date specific. As additional data become available, geologic interpretations may be revised and the map may be updated by the Geological Survey. This map should not be enlarged or otherwise used in an attempt to interpret more detail than can be seen at the 1:24,000 scale.

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Index map showing the location of the study area