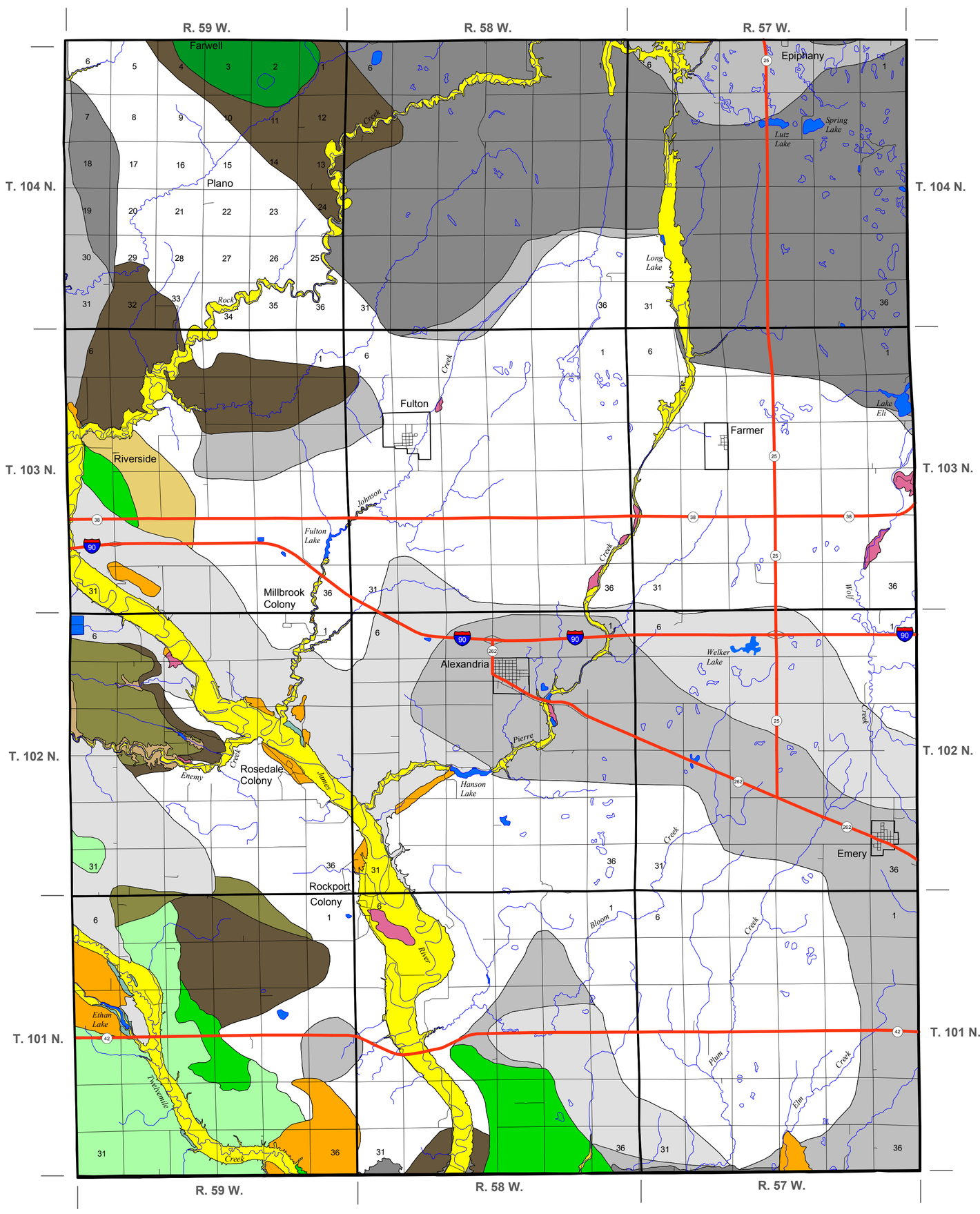
First Occurrence of Aquifer Materials in Hanson County, South Dakota

Department of Environment and Natural Resources
Division of Financial and Technical Assistance
Geological Survey
Aquifer Materials Map 27
Ann R. Jensen, 2008

State of South Dakota
M. Michael Rounds, Governor

South Dakota Geological Survey
Derric L. Iles, State Geologist



Digital cartography by B.A. Fagnan and L.D. Schulz
Layout edited by C.K. Odenbrett

Scale: 1:100,000

0 1 2 3 4 5 6 Miles

0 1 2 3 4 5 6 Kilometers

N
W E
S

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.

First occurrence is generally less than or equal to 50 feet below land surface

- **Alluvium:** Consists of silt and clay with minor amounts of sand and gravel
- **Sand and Gravel:** First occurrence is generally at land surface; may contain minor amounts of clay and silt
- **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
- **Niobrara Formation:** First occurrence is generally at land surface, light- to medium-blue-gray marl and white to cream colored limestone, weathers white to dark-yellowish-orange
- **Niobrara Formation:** First occurrence is generally below land surface, light- to medium-blue-gray marl and white to cream colored limestone, weathers white to dark-yellowish-orange
- **Codell Sandstone Member - Carlile Shale:** First occurrence is generally at land surface; white, green, light-gray to dark-gray, fine-grained sandstone; interbedded with dark-gray shale; some limestone beds; uncemented to cemented; weathers light-yellow to orange
- **Codell Sandstone Member - Carlile Shale:** First occurrence is generally below land surface; white, green, light-gray to dark-gray, fine-grained sandstone; interbedded with dark-gray shale; some limestone beds; uncemented to cemented; weathers light-yellow to orange
- **Sioux Quartzite:** First occurrence is generally at land surface; pink to red; extremely hard, fine- to medium-grained, well-rounded quartz sand, silica cemented orthoquartzite; sometimes conglomeric and jointed

First occurrence is generally greater than 50 feet and less than or equal to 100 feet below land surface

- **Sand and Gravel:** May contain minor amounts of clay and silt; may not be uniform in depth and thickness and may be discontinuous in lateral extent
- **Niobrara Formation:** Light- to medium-blue-gray marl and white to cream colored limestone, weathers white to dark-yellowish-orange
- **Codell Sandstone Member - Carlile Shale:** White, green, light-gray to dark-gray, fine-grained sandstone; interbedded with dark-gray shale; some limestone beds; uncemented to cemented; weathers light-yellow to orange

First occurrence is generally greater than 100 feet below land surface

- **Sand and Gravel:** May contain minor amounts of clay and silt; may not be uniform in depth and thickness and may be discontinuous in lateral extent
- **Niobrara Formation:** Light- to medium-blue-gray marl and white to cream colored limestone, weathers white to dark-yellowish-orange
- **Codell Sandstone Member - Carlile Shale:** White, green, light-gray to dark-gray, fine-grained sandstone; interbedded with dark-gray shale; some limestone beds; uncemented to cemented; weathers light-yellow to orange
- **Dakota Formation:** Brown, medium-grained sandstone interbedded with shale layers

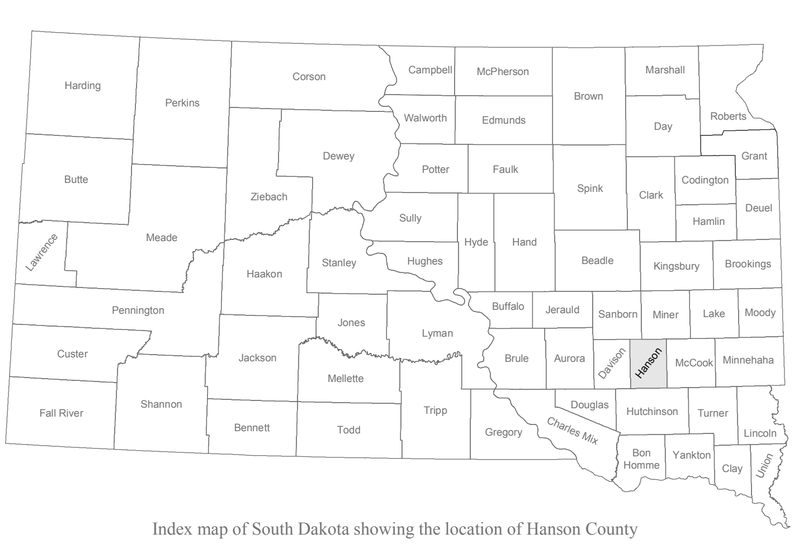
Area where Sioux Quartzite occurs from near land surface to greater than 400 feet below land surface. Within this area minor amounts of aquifer material may exist. The Sioux Quartzite is generally not an aquifer, but may yield water from fractures or porous zones.

- Major highway
- Road
- Township boundary
- River or stream
- Lake
- Slough or intermittent lake

For township section numbering system, see T. 104 N., R. 59 W.

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 1:100,000 scale.

Publication Date: May 14, 2008



Index map of South Dakota showing the location of Hanson County

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

Barari, A., 1966, *Ground-water supply for the city of Mitchell, South Dakota*: South Dakota Geological Survey Special Report 42, 45 p.

Barari, A., Green, S., and Roenick, M., 1981, *Ground-water study for the city of Mitchell*: South Dakota Geological Survey Open-File Report on Urban and Rural Studies 20, 103 p.

Christensen, C.M., 1989, *Geology of Davison and Hanson Counties, South Dakota*: South Dakota Geological Survey Bulletin 33, 22 p.

Cripe, C., and Barari, A., 1977, *Ground-water study for the Hanson Rural Water System*: South Dakota Geological Survey Open-File Report on Urban and Rural Studies 18, 79 p.

Hammond, R.H., 1982, *Sand and gravel resources in Hanson County, South Dakota*: South Dakota Geological Survey Information Pamphlet 25, 35 p.

Hansen, D.S.,1983a, *Major aquifers in Hanson and Davison Counties, South Dakota*: South Dakota Geological Survey Information Pamphlet 26, 11 p.

_____1983b, *Water resources of Hanson and Davison Counties, South Dakota*: U.S. Geological Survey Water-Resources Investigations Report 83-4108, 55 p.

Hoff, J.H., and Steece, F.V., 1961, *Geology of the Mitchell quadrangle, South Dakota*: South Dakota Geological Survey 15 minute Geologic Quadrangle, scale 1:62,500.

Jensen, A.R., 2002, *First occurrence of aquifer materials in Miner County, South Dakota*: South Dakota Geological Survey Aquifer Materials Map 12, scale 1:100,000.

_____2007, *First occurrence of aquifer materials in Hutchinson County, South Dakota*: South Dakota Geological Survey Aquifer Materials Map 25, scale 1:100,000.

Jorgensen, D.G., 1960, *Geology and ground water resources at Ethan, South Dakota*: South Dakota Geological Survey Special Report 5, 19 p.

Lindgren, R.J., and Hansen, D.S., 1990, *Water resources of Hutchinson and Turner Counties, South Dakota*: U.S. Geological Survey Water-Resources Investigations Report 90-4093, 100 p.

_____1993, *Major aquifers in Hutchinson and Turner Counties, South Dakota*: South Dakota Geological Survey Information Pamphlet 45, 12 p.

Koch, N.C., and McGarvie, S.D., 1988, *Water resources of Miner County, South Dakota*: U.S. Geological Survey Water-Resources Investigations Report 86-4035, 37 p.

Schulz, L.D., 2001, *First occurrence of aquifer materials in Sanborn County, South Dakota*: South Dakota Geological Survey Aquifer Materials Map 6, scale 1:100,000.

Schulz, L.D., and Smith, K.N., 2004, *First occurrence of aquifer materials in Davison County, South Dakota*: South Dakota Geological Survey Aquifer Materials Map 16, scale 1:100,000.

South Dakota Geological Survey Lithologic logs database.

Steece, F.V., and Howells, L.W., 1965, *Geology and ground-water supplies in Sanborn County, South Dakota:* South Dakota Geological Survey Bulletin 17, 182 p.

Tomhave, D.W., and Schulz, L.D., 2004, *Bedrock geologic map showing configuration of the bedrock surface in South Dakota east of the Missouri River*: South Dakota Geological Survey General Map 9, scale 1:500,000.

Wong, H.D., 1960, *Geology of the Alexandria quadrangle, South Dakota*: South Dakota Geological Survey 15 minute Geologic Quadrangle, scale 1:62,500.