



**STATE OF SOUTH DAKOTA**  
Department of Environment & Natural Resources  
Division of Financial and Technical Assistance  
Geological Survey  
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**Cross Sections Showing Geophysical Logs of Phanerozoic Rocks in South Dakota**  
**Plate 4. Structural Cross Section D-D'**  
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2009

**Explanation**

The youngest geologic contact interpreted in areas west of the Missouri River is the contact between the Niobrara Formation and the Pierre Shale. It is recognized that younger geologic units often cross the Pierre Shale, but they were not interpreted for this cross section.

Correlation line as a non-removable geologic contact. Interpreted from a geophysical log or lithologic description. Quoted where uncertain.

Correlation line as a removable geologic contact. Interpreted from a geophysical log or lithologic description. Quoted where uncertain.

Profile of land surface derived from U.S. Geological Survey digital elevation models.

Benneville bed

Boundary of nonconformity change. Boundary shown in index map below. Boundary and nonconformities generally coincide with Fahnestock and others (2007).

Correlation lines are not intended to show detailed structure or actual elevation of a geologic unit between data points. Correlation lines are not projected to land surface near the Black Hills area through some geologic units with crop out. The generalized nature of the cross section does not lead to misinterpretation of the cross-section area.

Depth of well, in feet, where fully logged.

Marker for a geologic contact.

Horizontal and vertical scales of cross section.

Vertical exaggeration = 52.8X

**Index map showing locations of data points used for construction of cross sections**

Map location number (MLN) and depth, in feet, to top of geologic unit (see table on this plate).

Line of cross section. Line used for the cross sections shown on this plate.

Approximate boundary of geologic unit in South Dakota. Bound of geologic unit as shown in index map. From Fahnestock and others (2007).

**Index map showing surface geology along the line of cross section in South Dakota**

Modified from Harris and others (2004).

Map location number (MLN) and depth, in feet, to top of geologic unit (see table on this plate).

Line of cross section.

**References**

Cole, J.C., Amundson, C.S., and Hillberg, L.L., 1986. Paleogeographic reconstruction of the Paleozoic geology of Wyoming. Wyoming Geological Survey, Geological Survey Report 86-10, 100 pp.

Fahnestock, M.D., Hovius, J.V., Amundson, C.S., Hillberg, L.L., Schick, L.B., and Riddle, J.A., 2007. South Dakota geologic map. Wyoming Geological Survey Map 86-10, 1:500,000.

Iles, D.L., 1993. Paleogeographic reconstruction of the Paleozoic geology of Wyoming. Wyoming Geological Survey Report 93-10, 100 pp.

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