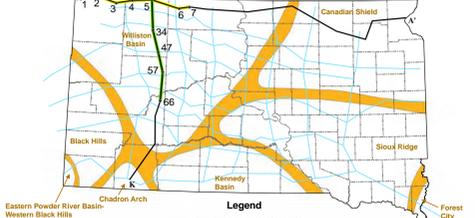


Preliminary Correlation of the Three Forks Shale in the Subsurface of Western South Dakota

- Map location number 1**
STANOLIND I CLARK
API 40 063 05067
NE NE 1/4 sec. 11, T. 22 N., R. 2 E.
Harding County, South Dakota
Kelly bushing elevation: 3,047 ft
Ground surface elevation: 3,035 ft
Log types shown: spontaneous potential and resistivity
- Map location number 2**
LUFF I-32 JANVRIN
API 40 063 20212
NE SE 1/4 sec. 32, T. 23 N., R. 2 E.
Harding County, South Dakota
Kelly bushing elevation: 2,987 ft
Ground surface elevation: 2,974 ft
Log types shown: gamma ray, spontaneous potential, and resistivity
- Map location number 3**
BARRETT I-33 STATE
API 40 063 20381
NW NW 1/4 sec. 33, T. 22 N., R. 8 E.
Harding County, South Dakota
Kelly bushing elevation: 2,917 ft
Ground surface elevation: 2,905 ft
Log types shown: gamma ray and resistivity
- Map location number 4**
HUNT I GOVT
API 40 105 05066
NW SE 1/4 sec. 8, T. 22 N., R. 11 E.
Perkins County, South Dakota
Kelly bushing elevation: 2,690 ft
Ground surface elevation: 2,678 ft
Log types shown: gamma ray, spontaneous potential, and resistivity
- Map location number 5**
WEBB I-32 SPENNY
API 40 105 20015
NW NE 1/4 sec. 3, T. 22 N., R. 14 E.
Perkins County, South Dakota
Kelly bushing elevation: 2,501 ft
Ground surface elevation: 2,488 ft
Log types shown: gamma ray, spontaneous potential, and resistivity
- Map location number 6**
COCKRELL I-6 STATE
API 40 031 20023
NW NW 1/4 sec. 16, T. 21 N., R. 19 E.
Corson County, South Dakota
Kelly bushing elevation: 2,332 ft
Ground surface elevation: 2,321 ft
Log types shown: gamma ray and resistivity
- Map location number 7**
CHEVRON I-3-5 BAILEY
API 40 031 20018
NW NE 1/4 sec. 5, T. 21 N., R. 21 E.
Corson County, South Dakota
Kelly bushing elevation: 2,173 ft
Ground surface elevation: 2,162 ft
Log types shown: spontaneous potential and resistivity
- Map location number 66**
TRUE I KNOX GOVERNMENT
API 40 103 05018
NW NW 1/4 sec. 29, T. 5 N., R. 17 E.
Pennington County, South Dakota
Kelly bushing elevation: 2,350 ft
Ground surface elevation: 2,339 ft
Log types shown: spontaneous potential and resistivity
- Map location number 57**
HERNDON I OAKLAND
API 40 093 05036
NE SE 1/4 sec. 20, T. 10 N., R. 17 E.
Meade County, South Dakota
Kelly bushing elevation: 2,367 ft
Ground surface elevation: 2,359 ft
Log types shown: spontaneous potential and resistivity
- Map location number 47**
EVANS I QUERRES TRUST CAPP
API 40 105 05001
NW NW 1/4 sec. 9, T. 13 N., R. 10 E.
Perkins County, South Dakota
Kelly bushing elevation: 2,570 ft
Ground surface elevation: 2,558 ft
Log types shown: spontaneous potential and resistivity
- Map location number 34**
SHELL I VEAL
API 40 105 05003
SE SE 1/4 sec. 7, T. 17 N., R. 15 E.
Perkins County, South Dakota
Kelly bushing elevation: 2,670 ft
Ground surface elevation: 2,656 ft
Log types shown: spontaneous potential and resistivity
- Map location number 5**
WEBB I-32 SPENNY
API 40 105 20015
NW NE 1/4 sec. 3, T. 22 N., R. 14 E.
Perkins County, South Dakota
Kelly bushing elevation: 2,501 ft
Ground surface elevation: 2,488 ft
Log types shown: gamma ray, spontaneous potential, and resistivity

Mack McGillivray, Senior Geologist
South Dakota DENR
Oil and Gas Section

Location of sections presented here, modified from Fox et al. (2009). Numbers on the index map below correspond to the map location number in the header of each geophysical log. Yellow highlight = section of A-A' presented to the left; Green highlight = section of K-K' presented to the right.

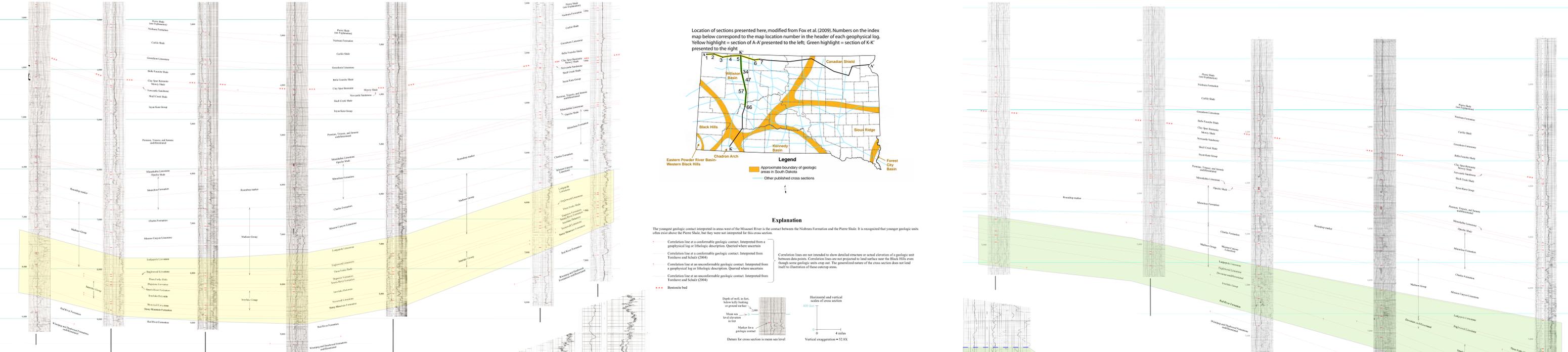


Explanation

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 exist above the Pierre Shale, but they were not interpreted for this cross section.

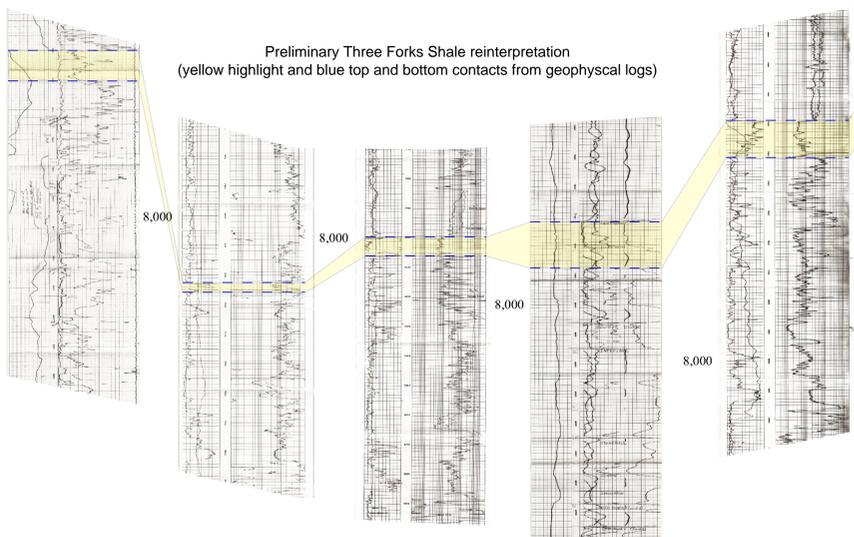
- Correlation line at a conformable geologic contact. Interpreted from a geophysical log or lithologic description. Obsolete where overruled from Tomber and Schultz (2004)
- Correlation line at a unconformable geologic contact. Interpreted from a geophysical log or lithologic description. Obsolete where overruled from Tomber and Schultz (2004)
- Correlation line at an unconformable geologic contact. Interpreted from Tomber and Schultz (2004)
- Basaltic bed

Depth of well, in feet, below well heading on ground surface.
Miles on horizontal scale.
Vertical exaggeration = 32.8X.



The above section is modified from Fox et al., 2009. Area in yellow is expanded in section below.

The above section is modified from Fox et al., 2009. Area in green is expanded in section below.



DISCUSSION

This chart is a compilation of geophysical log cross sections (A-A' and K-K') modified from Fox, J.E., McCormick, K.A., and Haggar, T.N., 2009, *Cross Sections Showing Geophysical Logs of Phanerozoic Rocks in South Dakota*: South Dakota Geological Survey, Oil and Gas Investigations 2.

The enlarged cross sections to the left and right were prepared by K.A. McCormick (DENR South Dakota Geological Survey), and the Three Forks Shale tops and bottoms were picked by F.V. Steece and G.L. (Mack) McGillivray (DENR Oil and Gas Section). The South Dakota picks were based on correlations with logs and publications from North Dakota (Julie LaFever and Stephen Nordeng, North Dakota Geological Survey) and Manitoba (Pamela Fulton-Regala and C. Winter, Manitoba Geological Survey).

This chart is preliminary, and is based on log interpretations only. Logs have not been compared with sample cuttings or core.