Test hole R20-2002-1 is located at NW¼ NW¼ NW¼ NE¼ sec. 13, T. 90 N., R. 50 W.
The highest readings are colored pink, the lowest in deep blue.

Figure 1. Aeromagnetic data from a flight line along the Missouri River from Yankton, South Dakota, to Ponca State Park, Nebraska.

The overshot retrieves the core barrel

Water is flowing freely through the core rod

Once the flowing formation was intersected, water flowed freely through the core rod when not coring. Photo is taken looking east. (December, 2002; drillers, from left to right: Dennis Iverson, Gary Jensen, Scott Jensen).

Figure 2. Photograph of coring through the flowing formation.

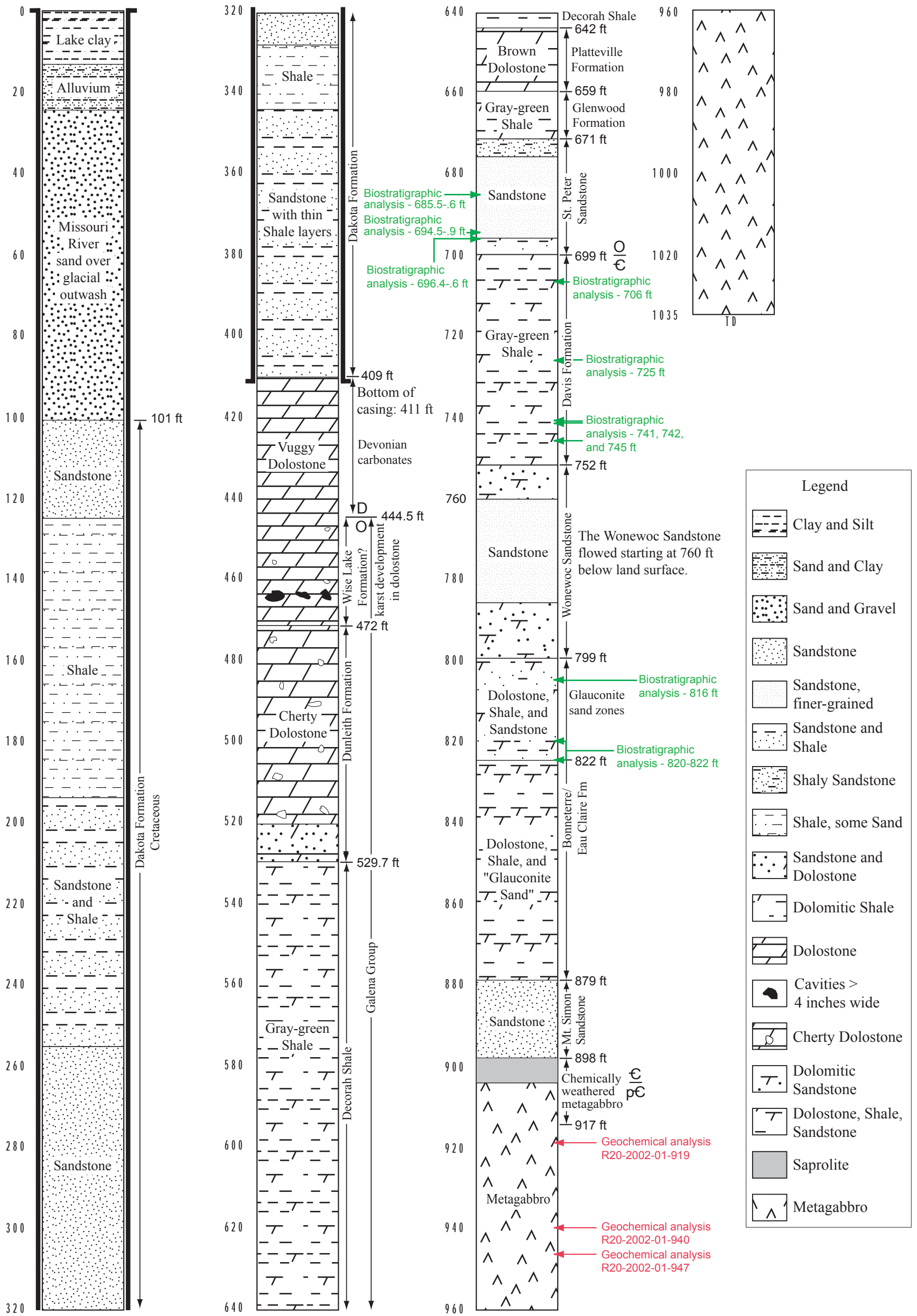D = Devonian; O = Ordovician; Є = Cambrian; pЄ = Precambrian

Column 1 (0–320 ft):

Lake clay

Alluvium

Missouri River sand over glacial outwash

101 ft

Sandstone

Shale

Sandstone and Shale

Sandstone

Dakota Formation | Cretaceous

Column 2 (320–640 ft):

Shale

Sandstone with thin Shale layers

Dakota Formation

409 ft
Bottom of casing: 411 ft

Devonian carbonates

Vuggy Dolostone

444.5 ft — D / O

Wise Lake Formation? karst development in dolostone

472 ft

Cherty Dolostone

Dunleith Formation

529.7 ft

Gray-green Shale

Galena Group

Decorah Shale

Column 3 (640–960 ft):

Decorah Shale
642 ft

Brown Dolostone — Platteville Formation

659 ft

Gray-green Shale — Glenwood Formation

671 ft

Sandstone — St. Peter Sandstone

Biostratigraphic analysis - 685.5-.6 ft
Biostratigraphic analysis - 694.5-.9 ft
Biostratigraphic analysis - 696.4-.6 ft

699 ft — O / Є

Biostratigraphic analysis - 706 ft

Gray-green Shale

Davis Formation

Biostratigraphic analysis - 725 ft

Biostratigraphic analysis - 741, 742, and 745 ft

752 ft

Sandstone — Wonewoc Sandstone

The Wonewoc Sandstone flowed starting at 760 ft below land surface.

799 ft

Biostratigraphic analysis - 816 ft

Dolostone, Shale, and Sandstone — Glauconite sand zones

822 ft

Biostratigraphic analysis - 820-822 ft

Dolostone, Shale, and "Glauconite Sand" — Bonneterre/Eau Claire Fm

879 ft

Sandstone — Mt. Simon Sandstone

898 ft — Є / pЄ

Chemically weathered metagabbro

917 ft

Geochemical analysis R20-2002-01-919

Metagabbro

Geochemical analysis R20-2002-01-940
Geochemical analysis R20-2002-01-947

Column 4 (960–1035 ft):

TD

Legend

Symbol	Description
	Clay and Silt
	Sand and Clay
	Sand and Gravel
	Sandstone
	Sandstone, finer-grained
	Sandstone and Shale
	Shaly Sandstone
	Shale, some Sand
	Sandstone and Dolostone
	Dolomitic Shale
	Dolostone
	Cavities > 4 inches wide
	Cherty Dolostone
	Dolomitic Sandstone
	Dolostone, Shale, Sandstone
	Saprolite
	Metagabbro

Figure 3. Graphic log of rocks intersected in test hole R20-2002-01.

Figure 4. A structure contour map of the Paleozoic surface in Union County, South Dakota.

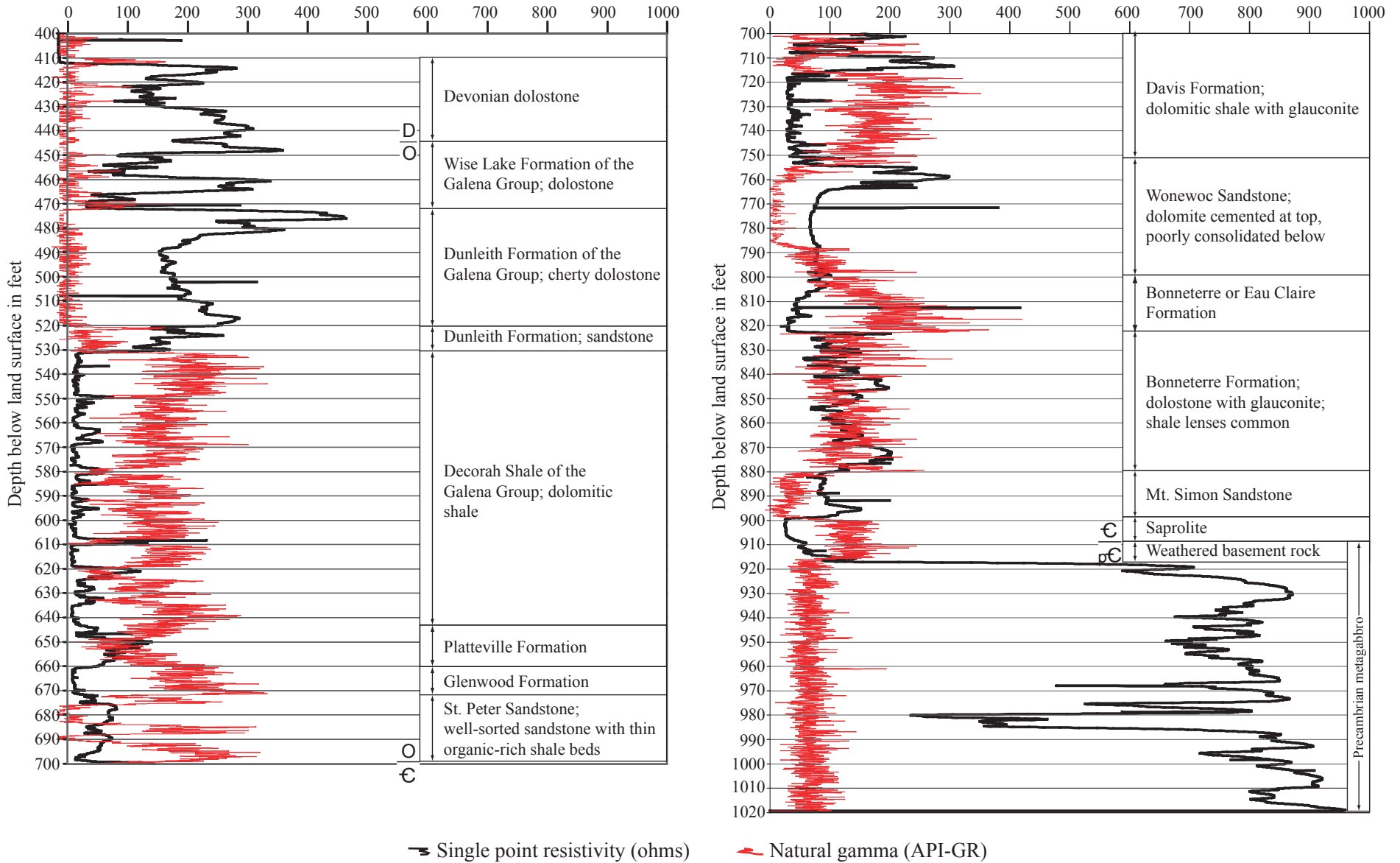Figure 5. A structure contour map of the Precambrian surface in Union County, South Dakota.

Figure 6. Geophysical log showing single point resistivity and natural gamma signatures of Paleozoic and Precambrian rocks in test hole R20-2002-01.
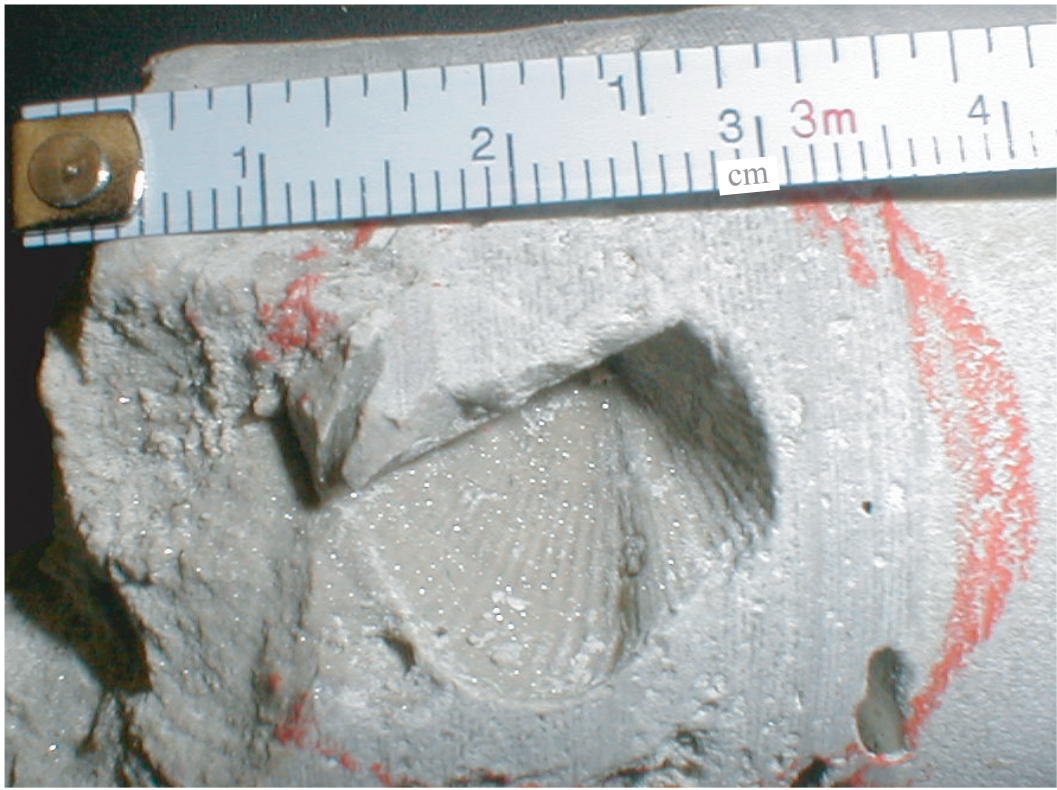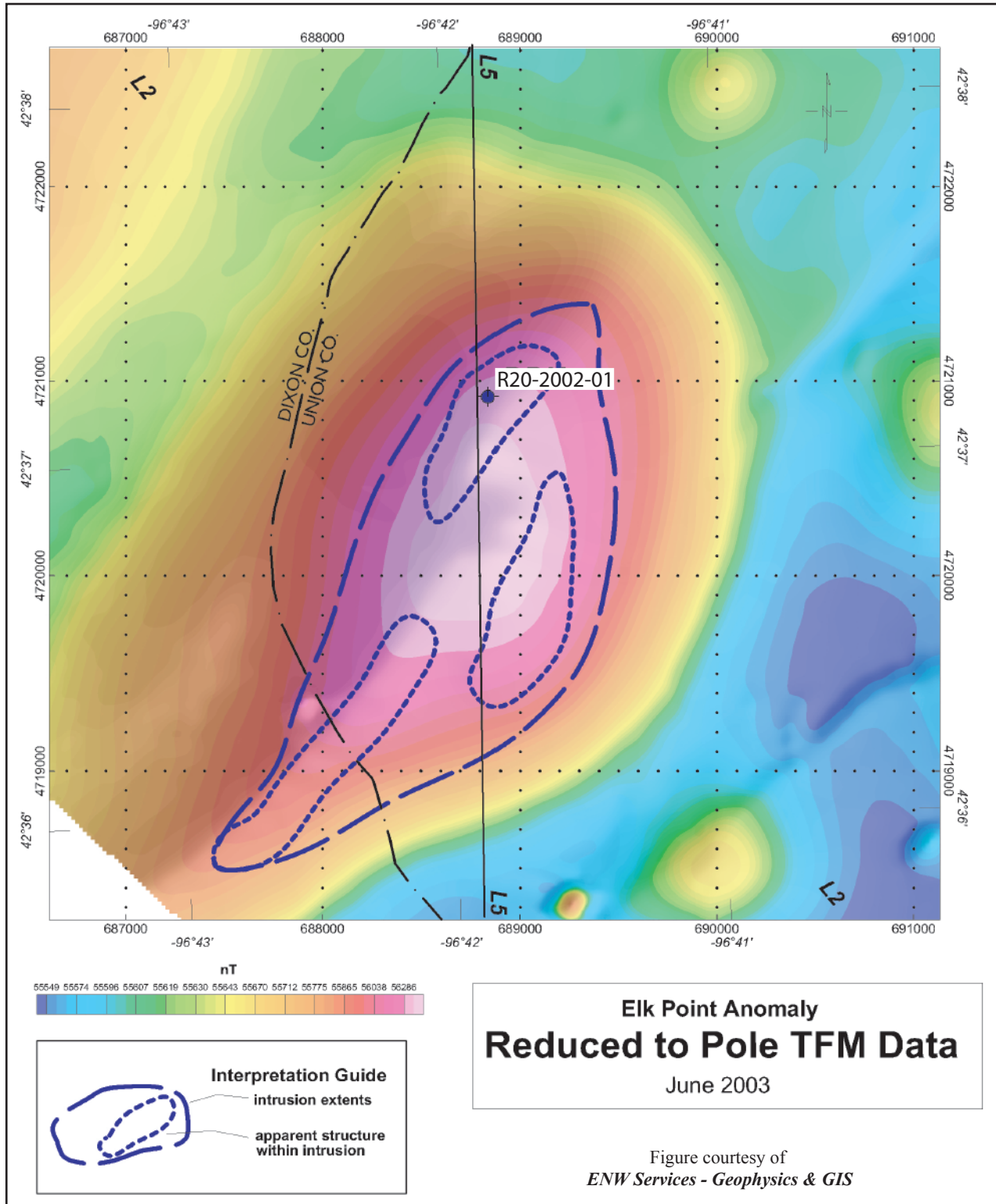
Figure 7. An exterior mold of a brachiopod (an indeterminate cyrtinid) of probably Devonian age in dolostone.

Figure 8. The block 6 aeromagnetic anomaly located 4 miles south of Elk Point, South Dakota.
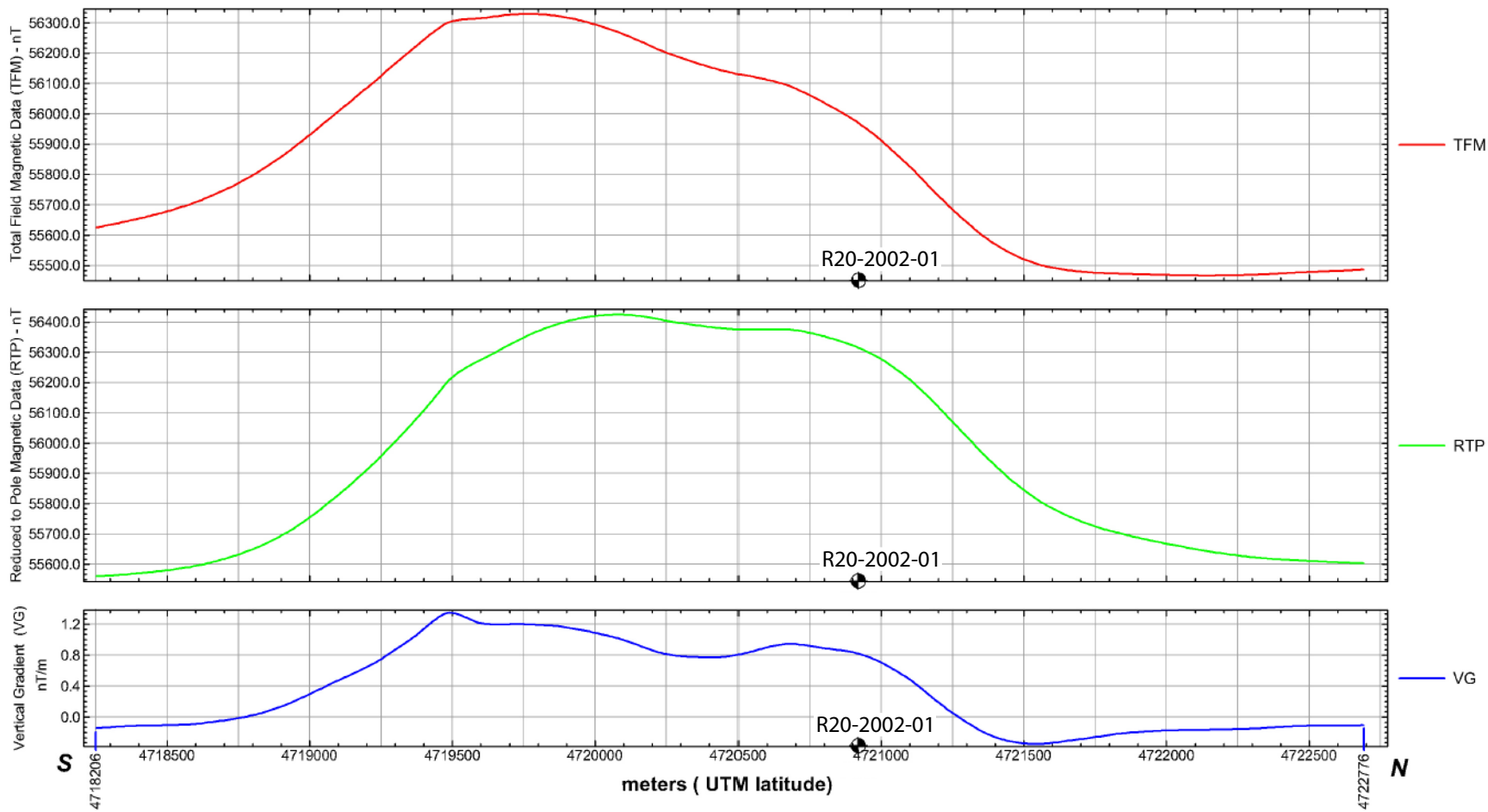
Figure 9. Profile along line 5 of the block 6 aeromagnetic anomaly.
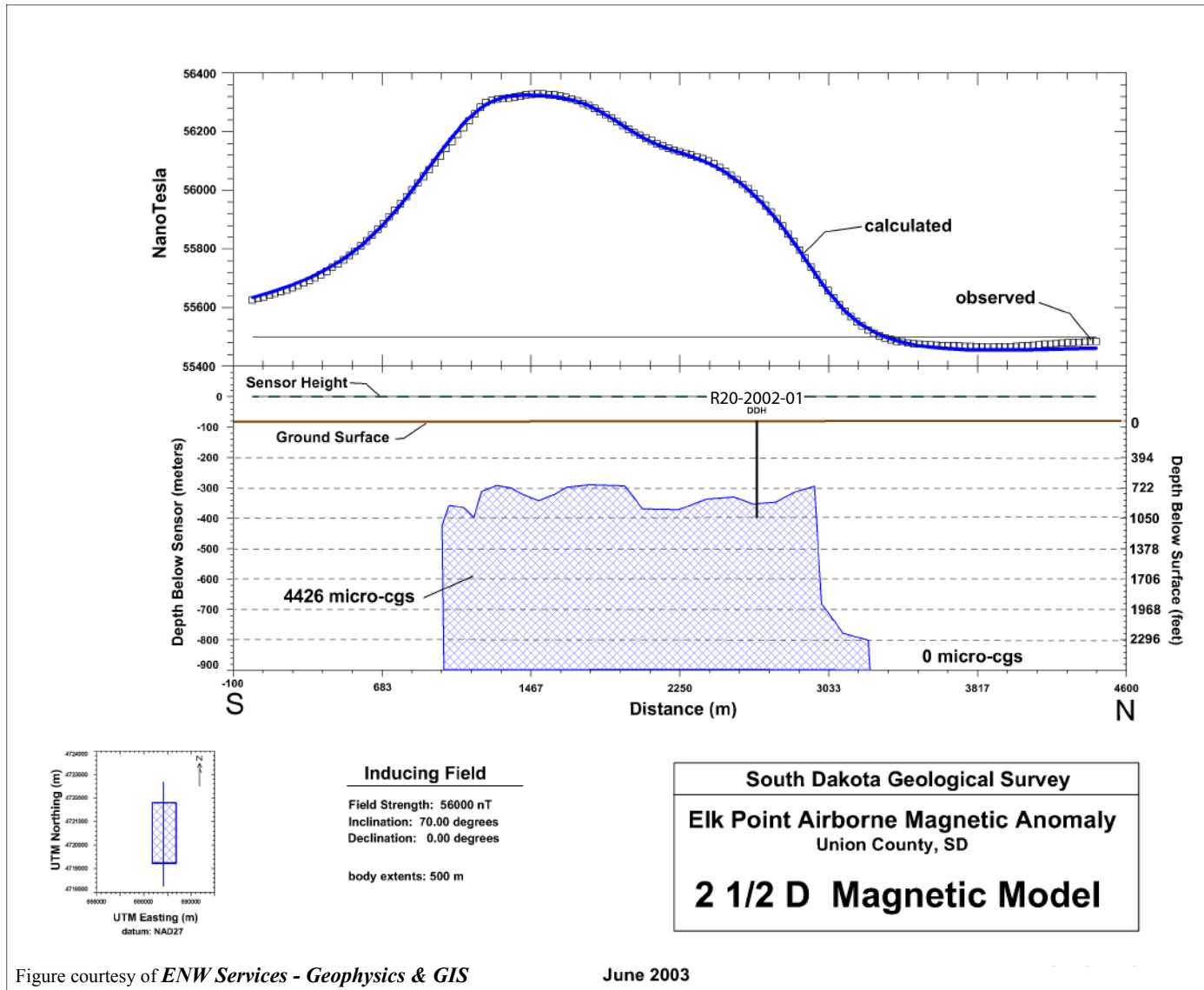
See figure 1 for location of block 6

Figure 10. A 2½-dimensional magnetic model of the block 6 aeromagnetic anomaly.