Department of Natural Resource Development
South Dakota Geological Survey

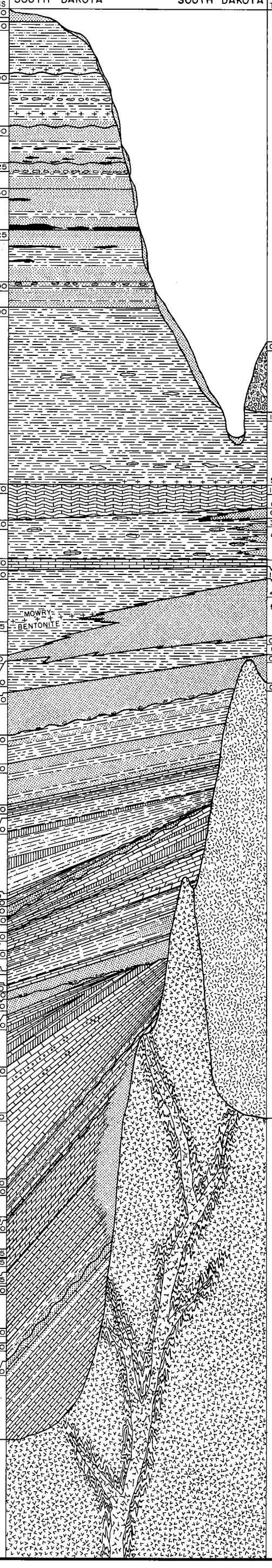
GENERALIZED STRATIGRAPHIC COLUMN OF CENTRAL AND NORTHWESTERN SOUTH DAKOTA — by Robert A. Schoon

Educational Series
Map Six

PERIOD / EPOCH	GROUP / FORMATION	DESCRIPTION	THICKNESS
QUATERNARY	PLEISTOCENE	Sand, gravel, boulders.	0-60
TERTIARY — MIOCENE	ARIKAREE GROUP	Clay and silt, light colored, soft to cemented; white ash bed at base.	0-500
TERTIARY — OLIGOCENE	WHITE RIVER GROUP	Clay, pink, sandy and silty, chalcedony veins, massive.	0-600
TERTIARY — PALEOCENE	FORT UNION — TONGUE RIVER	Clay and sand, light colored, minor thin coal beds.	0-400
	FORT UNION — CANNONBALL	Shale, greenish gray, sandstone, yellow to buff as concretions and channel filling.	0-225
	FORT UNION — LUDLOW	Clay and sandstone, somber gray with some thin lignite beds. Shadehill (?) coal at base.	0-350
CRETACEOUS	HELL CREEK FORMATION	Shale, drab, soft brown (somber beds) and sandstone gray. Sandstone increases toward base. Thin lenses of lignite in upper part.	0-325
	FOX HILLS FORMATION	Sandstone, grayish white to carbonaceous gray shale. Ironstone concretions at top.	0-200
	PIERRE SHALE	Shale, light gray to dark gray.	2800
	NIOBRARA FORMATION	Chalk, light to dark gray, white speckled, microfossiliferous.	270
	CARLILE SHALE	Shale, medium to dark gray plastic to fissile - scattered Ironstone concretions.	320
	GREENHORN LIMESTONE	Limestone, white to light gray, slabby, very fossiliferous with dark gray, white speckled shale at top and at base.	70
	BELLE FOURCHE SHALE	Shale, dark gray, dolomite and ironstone concretions.	370
	MOWRY SHALE	Shale, medium gray, siliceous, bentonite marker at top.	275
	NEWCASTLE SANDSTONE	Sandstone, white to light gray, fine-grained in part, very shaley.	0-100
	SKULL CREEK SHALE	Shale, dark gray with thin glauconitic siltstone near middle of interval.	200-250
	INYAN KARA GROUP (FALL RIVER AND LAKOTA SANDSTONE)	Sandstone, white to light gray, fine to medium-grained quartz, predominately friable.	320
JURASSIC	MORRISON FORMATION	Shale, medium gray, interbedded with sandstone, white, fine grained, glauconitic.	180
	SUNDANCE FORMATION	Sandstone, white, fine to medium grained, glauconitic, interbedded with shale, gray, green and brown.	320
TRIASSIC	PIPER LIMESTONE	Limestone, white to brown, fine grained, interbedded with shale, green, red and brown.	90
	SPEARFISH FORMATION	Shale, silty, orange, brick red, green and minor gray. Interbedded with anhydrite, gypsum and salt.	0-600
PERMIAN	MINNEKAHTA LIMESTONE	Limestone, white to lavender, fine, dense.	0-50
	OPECHE SHALE	Shale, brick red, silty.	0-50
PENNSYLVANIAN	MINNELUSA — CASSA[3]	Sandstone, white, brick red, clayey.	0-80
	MINNELUSA — BROOM CREEK[3]	Anhydrite, white to light brown, limestone and dolomite, white to light gray, silty.	80-300
	MINNELUSA — WENDOVER-MEEK[3]	Limestone, dolomite, light gray, fine, silty, anhydrite, light brown and gray. "Red Shale Marker" at top.	175-200
	MINNELUSA — HAYDEN[3]	Limestone, light gray to brown interbedded with black radioactive shale.	140-170
	MINNELUSA — ROUNDTOP[3]	Shale, green to minor red, plastic, sands up eastward	100-160
	MINNELUSA — RECLAMATION[3]	Ls, white to black, lithographic, varicolored shale	0-80
	MINNELUSA — FAIRBANK[3]	Sandstone, white to red, in part shaley.	0-100
MISSISSIPPIAN	KIBBEY SANDSTONE	Sandstone, white to gray, medium to coarse grained.	0-120
	CHARLES FORMATION	Limestone, white to light tan, lithographic, interbedded with anhydrite, white to light blue and light brown.	0-400
	MISSION CANYON FORMATION	Limestone, white to light tan, fine to oolitic, in part anhydritic.	120-320
	LODGEPOLE FORMATION	Limestone, light to medium brown, gray, fine to medium grained, in part sucrosic.	120-550
DEVONIAN	ENGLEWOOD	Dolomitic siltstone and varicolored shale	0-60
	DUPEROW	Light brown, fine grained limestone and dolomite, interbedded with thin gray shale.	0-240
SILURIAN	SOURIS RIVER	Varicolored shale and red dolomitic siltstone	0-30
	INTERLAKE	Light tan to brown dolomite, fine grained clastics at base.	0-250
ORDOVICIAN	STONEWALL	Light tan to pale dolomite, locally sandy.	0-75
	STONY MOUNTAIN	Brownish gray fine grained dolomite at top with green waxy shale and siltstone at base.	0-155
	RED RIVER (UNIT A)	Light brown to pale red	0-115
	RED RIVER (UNIT B)	limestone, in part dolomitized, and light colored chert. Threefold subdivision is mainly based	0-320
	RED RIVER (UNIT C)	E-log characteristics.	0-100
	WINNIPEG	Fine grained quartz sandstone at base, green, splintery to subwaxy shale with small vitreous black phosphate nodules interbedded with siltstone at top.	0-150
CAMBRIAN	DEADWOOD	White to reddish-orange, fine to medium grained quartz sandstone and dolomite, contains green shale partings and locally abundant glauconite.	0-630
PRECAMBRIAN		Igneous and metamorphic rock.	

STRATIGRAPHIC SECTION

NORTHWESTERN SOUTH DAKOTA — CENTRAL SOUTH DAKOTA



DESCRIPTION	THICKNESS	GROUP / FORMATION	PERIOD / EPOCH
Clay, sand, pebble and boulder mixture.	0-500	PLEISTOCENE	QUATERNARY
Shale, medium to dark gray with limestone and ferruginous concretions. Many thin bentonites.	1000-1300	PIERRE SHALE	CRETACEOUS
Shale, dark gray, carbonaceous. Bentonite at base.			
Chalk, light to dark gray, white, speckled, microfossiliferous	120-150	NIOBRARA FORMATION	
Sandstone, white to gray, glauconitic.	0-70	CODELL SANDSTONE	
Shale, medium to dark gray, plastic, ironstone concretions and stringers of fine grained sandstone.	330	CARLILE SHALE	
Limestone, white to light gray, fossiliferous.	40	GREENHORN LIMESTONE	
Shale, dark gray, fissile to blocky, ironstone concretions.	110	GRANEROS SHALE[1]	
Sandstone, white, fine to medium grained, friable to well consolidated.	450	DAKOTA SANDSTONE[2]	
Sandstone, dark gray, glauconitic, siltstone near middle part.	0-150	SKULL CREEK SHALE	
Sandstone, white, fine to coarse grained quartz.	0-225	INYAN KARA GROUP	
Sioux Ridge composed of pale maroon to red orthoquartzite.	0-7000 ?	SIOUX QUARTZITE	PRECAMBRIAN
Igneous and metamorphic rock.			

1 As defined by Hattin, D.E., 1965. Stratigraphy of the Graneros Shale (Upper Cretaceous) in Central Kansas. Kansas Geological Survey, Bull. 178, 83 pp.

2 As described by Meek, F.B., and Hayden, F.V., 1861. Philadelphia Academy of Natural Resources Proceedings, v. 13, p. 419-20.

3 Condra, G.E., Reed, E.C., and Scherer, O.S., 1940. Correlations of the Formations of the Laramie Range, Hartville Uplift, Black Hills and western Nebraska, Nebraska Geological Survey Bull. 13, 52 pp.

In view of the equivalency of the Hartville "Formation" and the Minnelusa, the Hartville subdivisions are employed in the Minnelusa in South Dakota.

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