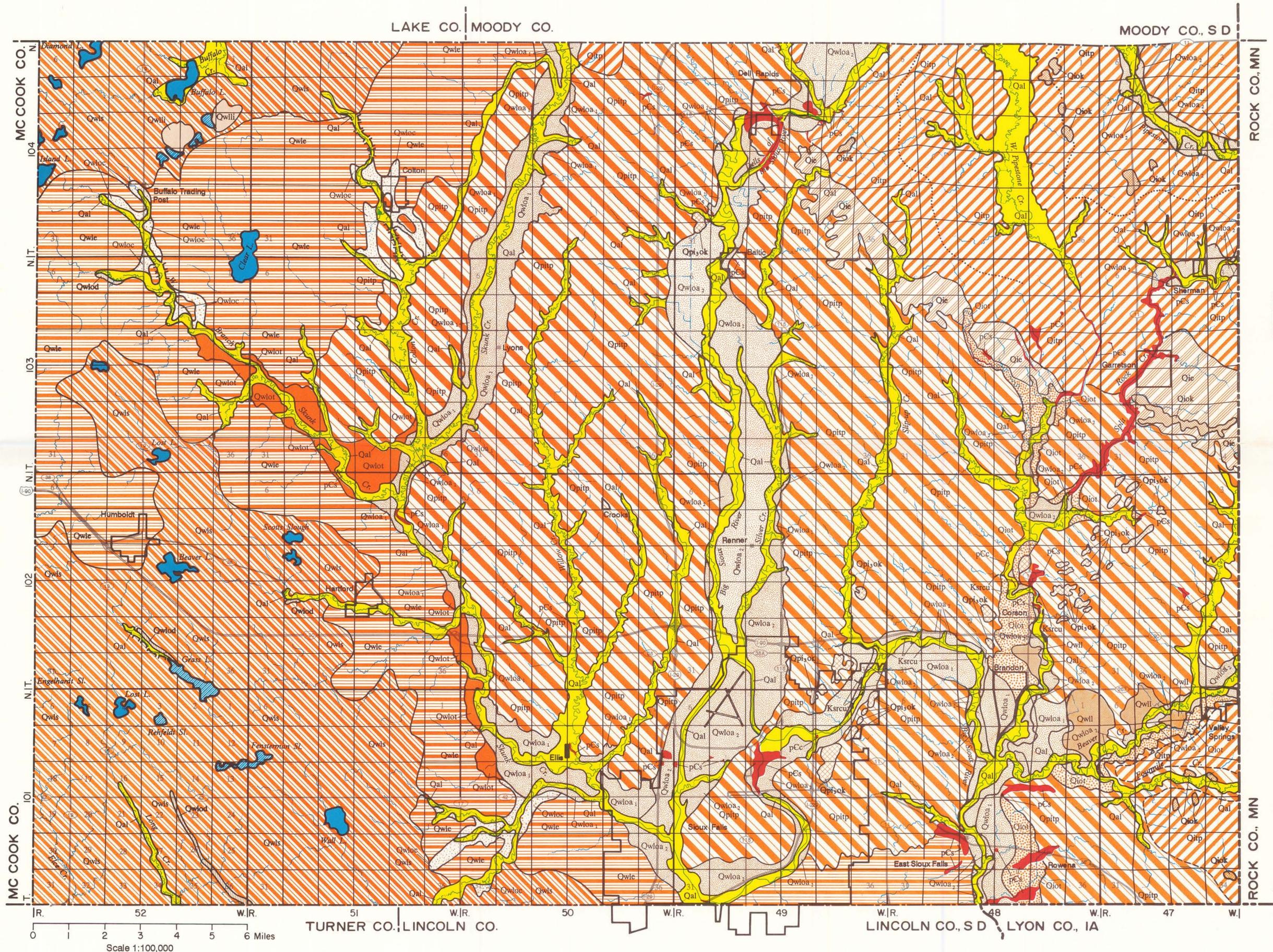


Plate 4. Geology and Landforms of Minnehaha County, South Dakota.

Department of Environment and Natural Resources
Division of Geological Survey

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HOLOCENE	Qal	ALLUVIUM Floodplain deposits of silt and clay with minor amounts of sand and gravel; relatively flat surface above normal river level.
	Qwloa₁ Qwloa₂	OUTWASH, VALLEY TRAIN Sand and gravel of glaciofluvial origin with minor alluvial overburden; confined to valley; sloping to relatively flat surface. Qwloa ₂ - (late) late Wisconsin valley-train deposits. Qwloa ₁ - (middle) late Wisconsin valley-train deposits.
LATE WISCONSIN	Qwlot	OUTWASH, TERRACE Sand and gravel of glaciofluvial origin; flat to gently sloping surface above the floodplain. Remnants of the earliest late Wisconsin valley-train deposits.
	Qwloc	OUTWASH, COLLAPSED Sand and gravel of glaciofluvial origin; with minor amounts of till; relatively flat to undulating surface.
	Qwloa	OUTWASH, DISINTEGRATION RIDGE Sand, gravel, and boulders, with minor amounts of silt and clay; linear ridges.
	Qwll	LACUSTRINE SEDIMENTS, LAKE PLAIN Clay and silt, with minor amounts of sand; relatively flat to gently sloping surface.
QUATERNARY	Qwll	LACUSTRINE SEDIMENTS, ICE-WALLED LAKE PLAIN Clay and silt, with minor amounts of sand; elevated feature with a relatively flat surface.
	Qwle	TILL, END MORAINE Heterogeneous mixture of boulders, sand, silt, and clay; relatively elevated topography, with boulder-strewn ridges; some linear features present.
PLEISTOCENE	Qwle	TILL, END MORAINE Heterogeneous mixture of boulders, sand, silt, and clay; relatively elevated topography, with boulder-strewn ridges; some linear features present.
	Qwls	TILL, STAGNATION MORAINE Heterogeneous mixture of boulders, sand, silt, and clay; relatively rugged hummocky topography; contains many sloughs and closed depressions.
ILLINOIAN(?)	Qlot	OUTWASH, TERRACE Sand and gravel of glaciofluvial origin; flat to gently sloping surface above late Wisconsin outwash terraces.
	Qlot	OUTWASH, KAMES AND KAME TERRACES Sand and gravel of glaciofluvial origin, with minor amounts of silt and clay; moundlike hills.
PRE-ILLINOIAN	Qlic	TILL, END MORAINE Heterogeneous mixture of boulders, sand, silt, and clay with up to 20 feet of loess cover; relatively elevated topography; some linear features.
	Qlitp	TILL, BROOKINGS TILL PLAIN Heterogeneous mixture of boulders, sand, silt, and clay with up to 20 feet of loess cover; undulating topography; some stream dissection.
LATE CRETACEOUS	Qpi,ok	OUTWASH, KAMES AND KAME TERRACES Sand and gravel of glaciofluvial origin; may contain minor amounts of silt and clay; moundlike hills.
	Qpitp	TILL, MINNEHAHA TILL PLAIN Heterogeneous mixture of boulders, sand, silt, and clay with up to 50 feet of loess cover; very undulating, highly dissected topography; till of the pre-Illinoian 3 advance found on the highlands and till of the underlying pre-Illinoian 2 advance found in the low areas.
PRECAMBRIAN	Karcu	SPLIT ROCK CREEK FORMATION, UNDIFFERENTIATED Siltstone, claystone, chert, shale, clay, and sand; fractured and weathered in outcrop, near vertical exposures found along stream valleys.
	pCc	CORSON DIABASE Black to greenish-black intrusive crystalline rock; weathers to a brown to yellow-brown; found exposed in vertical cliffs and along stream bottoms. For outcrop locations, see secs. 10, 15, and 22, T. 102 N., R. 48 W., and sec. 11, T. 101 N., R. 49 W.
	pCs	SIOUX QUARTZITE Pink to red orthoquartzite; extremely hard, fine- to medium-grained, well rounded quartz sand, cemented with silica; with some conglomeritic beds and pipestone (Cattinites) layers; well jointed; found exposed in vertical cliffs along streams, in stream bottoms, and on topographic highs where overlying sediment has been removed.

	Probable recessional position of Illinoian(?) ice
	Geologic contact. Dashed where approximate.
	Meltwater channel
	Lake
	Intermittent lake
	Perennial stream
	Intermittent stream

For township section numbering system, see T. 101 N., R. 52 W.



Minnehaha County