



EXPLANATION

DESCRIPTION OF MAP UNITS

Quaternary

- Qal Alluvium
- Ql Landslide block
- Qc Colluvium and talus

Tertiary and Quaternary

- Qt Terrace deposits
- Qk Lakota Formation

LOCAL UNCONFORMITY

- Jm Morrison Formation
- Ju Unkapa Sandstone
- Js Sundance Formation

JURASSIC

- Jm Morrison Formation
- Ju Unkapa Sandstone
- Js Sundance Formation

UNCONFORMITY

- RP Spearfish Formation
- Pm Minnekahta Limestone
- Po Opeche Formation
- PPm Minnelusa Formation

PERMIAN AND TRIASSIC

- RP Spearfish Formation
- Pm Minnekahta Limestone
- Po Opeche Formation
- PPm Minnelusa Formation

PERMIAN AND PREPERMIAN CARBONIFEROUS

- RP Spearfish Formation
- Pm Minnekahta Limestone
- Po Opeche Formation
- PPm Minnelusa Formation

Contact

Dashed where approximately located;
short dashed where inferred;
dotted where concealed

Fault or abrupt downfold

Dashed where approximately located;
questioned where existence uncertain;
dotted where concealed. U, upthrown side; D, downthrown side

Anticline

Showing plunge and trace of axial plane

Strike and dip of beds

Quarry

Sample location

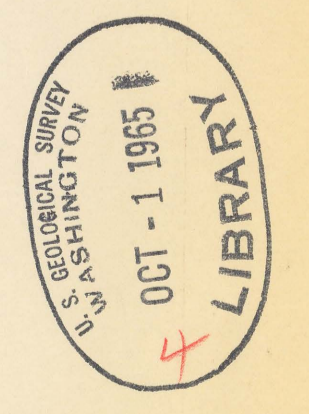
Selected References

Darton, M. H., 1909, Geology and water resources of the northern portion of the Black Hills and adjoining regions: U.S. Geological Survey Prof. Paper 65, 105 p.

Robinson, C. S., Mapel, W. J., Bergendahl, M. H., 1954, Stratigraphy and structure of the northern and western flanks of the Black Hills uplift, Wyo., Mont., and South Dakota: U.S. Geological Survey Prof. Paper 404, 154 p.

TEST DATA
[Analyses by George S. Erickson, U.S. Geol. Survey]

Field Sample Number	Formation Symbol	Location			Atterberg Limits			pH	Potential volume change (psf)	P.V.C. Rating
		Section	T.N.	R.E.	Liquid Limit	Plastic Limit	Plasticity Index			
R-2	Js	SE 34	2	7	36	28	8	7.65	2100	2.5 Marginal.
2-b	Js	SE 34	2	7	(2)	21	17	4	7.62	
2-1	(3)	NE 4	1	7	21	17	4	7.62		
2-m	RP	SE 33	2	7	36	25	11	7.45		
2-m	RP	SE 33	2	7	36	25	11	7.45	250	0.1 Noncritical.
R-7	Qal	SE 8	1	7	(2)	---	---	7.95		
1-q	Ju	SW 26	1	7	(2)	---	---	7.98		
1-m	Ju	NW 26	2	7	21	15	6	4.20		
1-m	Ju	NW 26	2	7	27	22	5	7.75	550	0.5 Noncritical.
2-k	Qal	NW 3	1	7	23	18	5	7.92		
2-kr	Qal	SW 3	1	7	29	24	5	7.75		
6-f	Po	NW 8	1	7	29	20	9	7.82		



Base is a 2X enlargement of the U.S. Geological Survey topographic map, 1953

PRELIMINARY GEOLOGIC MAP OF PART OF THE RAPID CITY QUADRANGLE, SOUTH DAKOTA
By J. Mark Catermole

1/ Lambe, T. W., 1960, The character and identification of expansive soils: Federal Housing Administration Tech. Studies Rept., F.H.A.-701, 46 p.
2/ Sandy.
3/ Soil.
4/ Sample from depth of 3 ft at same location as sample 2-m.
5/ Highway cut 400 ft and 800 ft east of this quadrangle.

South Dakota (Rapid City quad.)
M(200) R296 no. 65-29
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