



EXPLANATION

Alluvium
 Intermittent pond deposits
 Landslide material
 Undifferentiated terrace deposits

Terrace deposits on Square Buttes
 Distance above river
 Qm-1 to 10 feet, youngest
 Qm-2 to 20 feet
 Qm-3 to 30 feet
 Qm-4 to 40 feet
 Qm-5 to 50 feet, oldest

Terrace deposits on Square Buttes River
 Distance above river
 Qm-1 to 10 feet, youngest
 Qm-2 to 20 feet
 Qm-3 to 30 feet
 Qm-4 to 40 feet
 Qm-5 to 50 feet, oldest

Terrace deposits on Square Buttes Creek
 Distance above creek
 Qm-1 to 10 feet, youngest
 Qm-2 to 20 feet
 Qm-3 to 30 feet
 Qm-4 to 40 feet
 Qm-5 to 50 feet, oldest

Undifferentiated glacial deposits
 Low level of stratified sand, silt, and gravel.
 May be composed of glacial drift, alluvial deposits or terrace deposits.

Glacial till
 Lower deposits of stratified sand, gravel and silt.
 May be composed of glacial drift, alluvial deposits or terrace deposits.

Glacial terrace deposits
 Stratified silt, sand, gravel, and some cobble and pebbles of limestone, granite and metamorphic rocks, and fragments of peat, charcoal, and fossilized wood.

Glacial diversion channel deposits
 Interbedded sand, silt, and gravel, and some peat, charcoal, and fossilized wood, along bottom of former glacial melt water channels.

Clay and sand derived locally from Fort Union and other formations
 Clay and sand derived locally from Fort Union and other formations.

Golden Valley formation
 Light olive-gray silty shale, grayish-brown carbonaceous shale, clay and sand, and occasional thin beds of sandstone.

Fort Union formation
 Light gray to black silty to sandy shale, black-gray silty shale, and occasional thin beds of sandstone.

Canandaigua formation
 Olive-gray sandy siltstone and light gray to light green sandstone.

Geologic boundary
 Dashed where approximately located, dotted where confirmed.

Outcrop of coal bed
 Dashed where approximately located, dotted where confirmed.

Strip mine
 Abandoned strip mine

Adit
 Abandoned adit

Dry hole
 Glacial diversion channel

Gravel pit
 Clinch pit

Area possibly suitable for strip mining
 Overlain by less than 60 feet of sand and gravel or more as indicated.

GEOLOGIC MAP OF THE SQUARE BUTTES COAL FIELD, OLIVER AND MERCER COUNTIES, NORTH DAKOTA



Base map prepared from plane-table triangulation, Bureau of Land Management plans, and topographic maps.

Geology by W. G. Johnson, Jr., and R. P. Ramey, assisted by W. L. Adams, A. S. Hayward, G. N. Harbaugh, and R. W. Roberts, 1950-51.