North Dakota Geological Survey
24K: SgrB - sg

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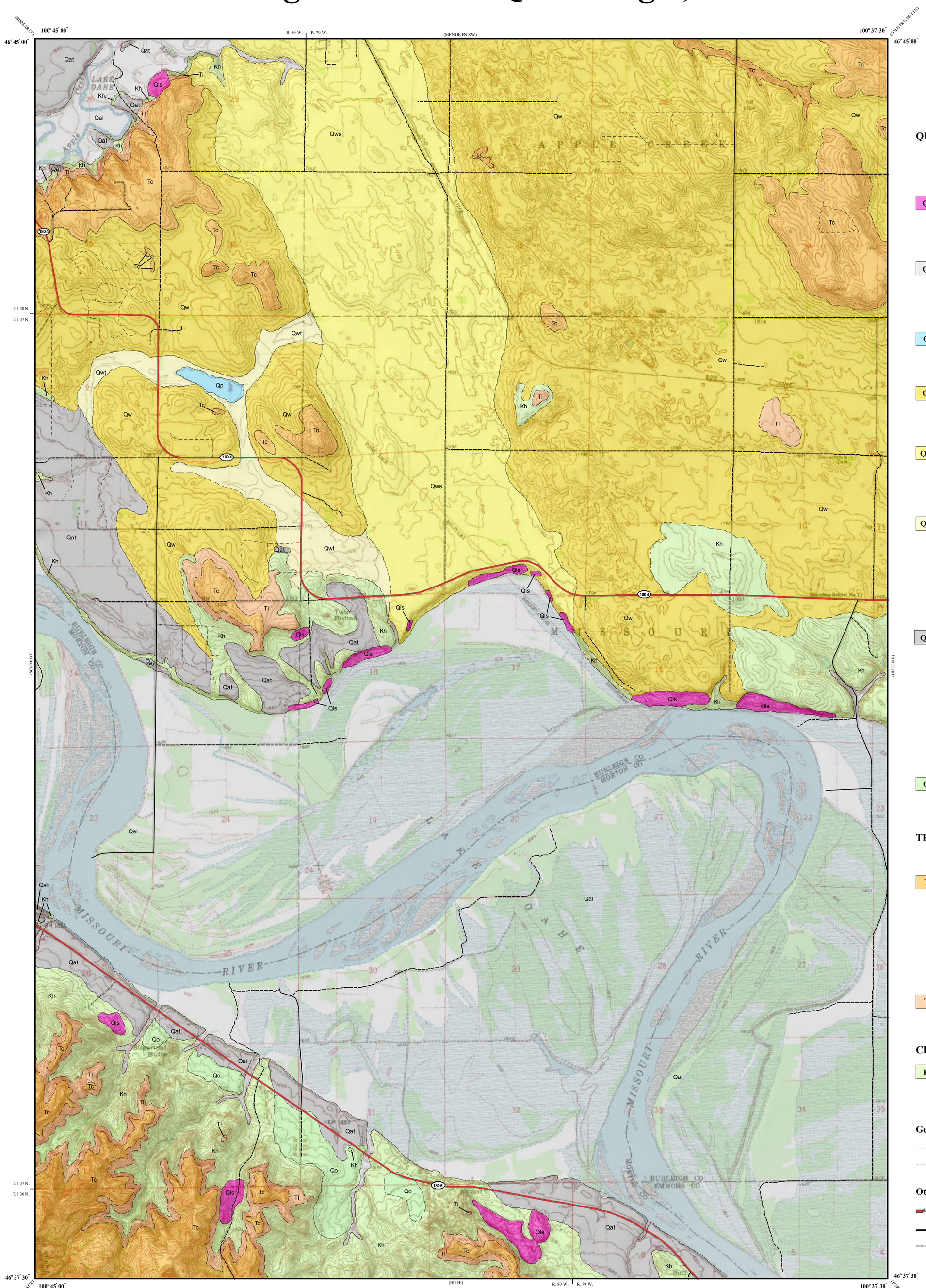
Surface Geology
Sugarloaf Butte Quadrangle, North Dakota



Edward C. Murphy
2014

UNIT DESCRIPTIONS

QUATERNARY SYSTEM

RECENT

OAHE FORMATION

Qls **Landslide Deposits**

A moderately to poorly sorted combination of soil,unconsolidated sediments, and sedimentary rocks that have slid down the local slope under their own weight. Most prevalent along valleys, ravines, and hillslopes.

Qal **Alluvium**

Moderately sorted lenses of sand, silt, clay, and occasionally gravel. Typically grayish brown to dark brown, moderately to obscurely bedded, and often contains aquatic shells and plant fragments. These Recent deposits are up to 50 feet thick in the Missouri River floodplain and up to 15 feet thick along creeks in the area.

Qp **Pond Sediment**

Typically laminated, dark brown to black, silt and clay found in topographically low areas. These deposits are generally less than 10 feet thick in this area.

Qw **Windblown Sediment**

Moderately to well sorted, grayish brown to tan, sand and silt. These sediments are present in this area as a mantle, slightly modifying the underlying topography. These deposits are generally less than 10 feet thick in this area.

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Moderately to well sorted, grayish brown to tan, sand and silt. These sediments are present in this area as a mantle, slightly modifying the underlying topography. These deposits are generally less than 10 feet thick in this area. Overlying the Soo Channel.

Qwt **Windblown Sediment**

Moderately to well sorted, grayish brown to tan, sand and silt. These sediments are present in this area as a mantle, slightly modifying the underlying topography. These deposits are generally less than 10 feet thick in this area. Overlying the Soo Tributary Channel.

PLEISTOCENE

COLEHARBOR GROUP

Qat **Alluvial Terrace Deposits**

Typically consist of gravel and medium- to coarse-grained sand. The gravel consists primarily of pebble- to cobble-sized igneous rock and locally derived rock fragments and is commonly iron stained and occasionally iron cemented. Overall, the unit is poorly sorted but it generally contains well-sorted sand lenses. These quartz sand lenses typically contain thin layers of lignite and clinker fragments.The sand and gravel lenses commonly range in thickness from10 to 20 feet and are typically overlain by three to 10 feet of wind blown silt. Alluvial deposits are generally found on terraces 20 to 50 feet above the Missouri River, between elevations of 1,640 to 1,700 feet. Terrace deposits are easily identified in aerial photographs and on the ground by flat surface topography and the presence of steep cliffs or hill slopes on the river side of the deposit.

Qo **Outwash**

Consists of moderately to poorly sorted sand and gravel deposited by melting glacial ice.

TERTIARY SYSTEM

PALEOCENE

Tc **CANNONBALL FORMATION**

Consists of alternating beds of marine sandstone and mudstone. The sandstone is grayish green to yellowish brown, medium to fine grained, generally poorly cemented and burrowed, containing the trace fossil ophiomorpha. The poorly cemented sandstone is commonly capped by a two- to three-foot-thick, well cemented, lenticular sandstone. The mudstone is light to dark gray to black, blocky claystone and commonly is banded with lenses of white to yellowish brown silt and very fine sand. The mudstone forms smooth, rounded slopes. The maximum thickness of the Cannonball Formation in this area is approximately 300 feet.

Tl **LUDLOW FORMATION**

Nonmarine, yellowish brown to grayish brown alternating beds of sandstone, siltstone, mudstone, and swelling claystone.

CRETACEOUS SYSTEM

Kh **HELL CREEK FORMATION**

Nonmarine, gray to grayish brown colored beds of sandstone, siltstone, mudstone, and swelling claystone.

Geologic Symbols

Known contact between two geologic units

Approximate contact between two geologic units

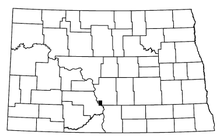
Other Features

Interstate Highway

Paved Road

Unpaved Road

NORTH DAKOTA GEOLOGICAL SURVEY 1895



Sugarloaf Butte Quadrangle, North Dakota

Scale 1:24,000

0 0.5 1

Miles

Lambert Conformal Conic Projection Standard Parallels 46° 37' 30" and 46° 45' 00"

1927 North American Datum NGVD 1929

USGS 7.5 Minute Topographic Map Contour Interval 10 Feet

Road Layer Rectified to 2003 NAIP Digital Orthophoto

1976 Magnetic North
Declination at Center of Sheet

Note: Sugarloaf Butte 24k quadrangle was not edgematched to adjacent mapped 24k quadrangles: Schmidt and Menoken SW.

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program. No. 1434-HQ-96-AG-01509.

Cartographic Compilation: Elroy L. Kadrmas