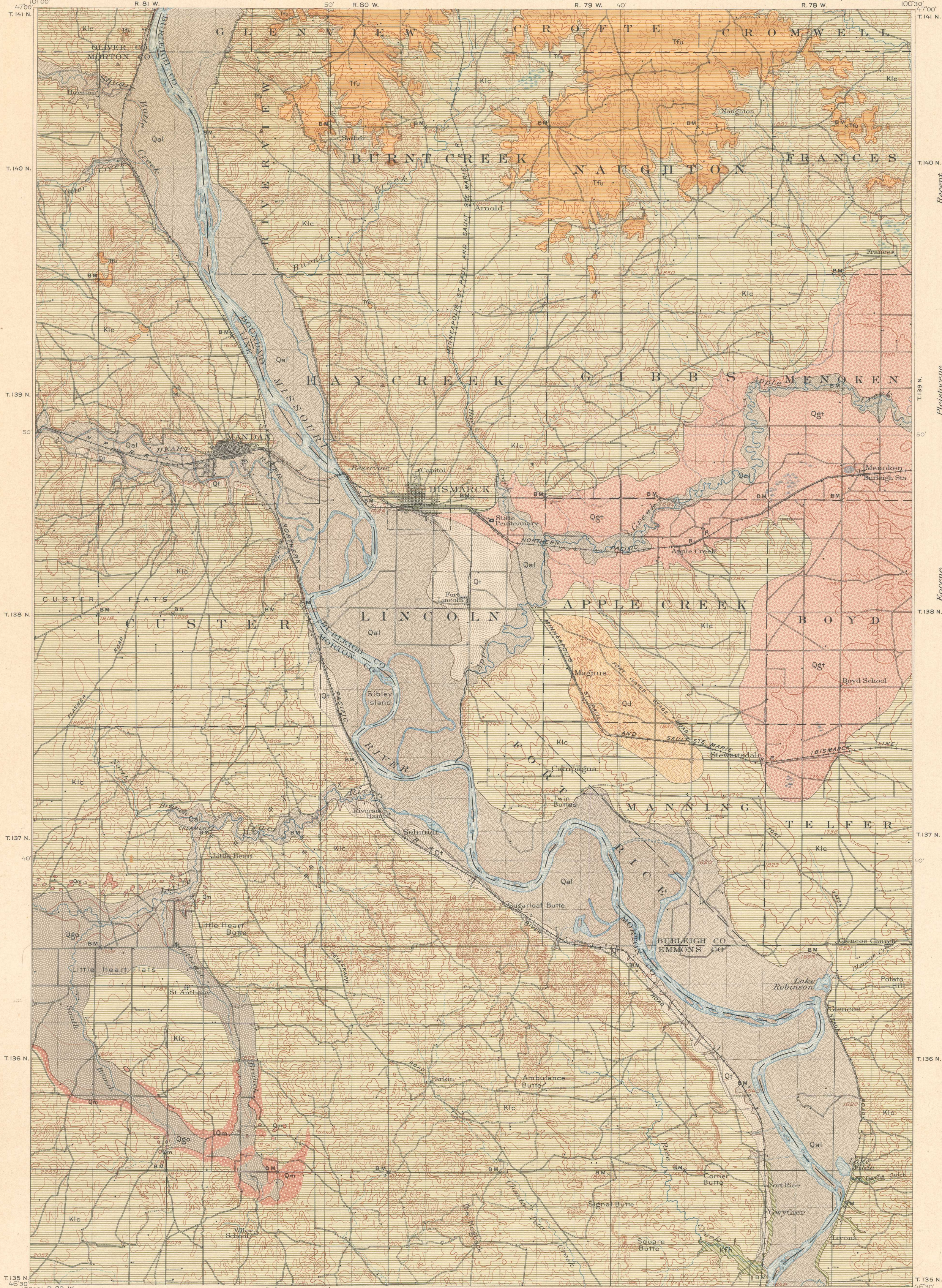


AREAL GEOLOGY

U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

STATE OF NORTH DAKOTA
A.G. LEONARD, STATE GEOLOGIST

NORTH DAKOTA
BISMARCK QUADRANGLE



LEGEND

SEDIMENTARY ROCKS
(Areas of subaqueous deposits are shown by patterns of parallel lines; subaerial deposits by patterns of dots and circles)

Recent
Qd
Dune sand
(wind blown sand derived from old stream alluvium)

Qal
Alluvium
(shown only in the larger valleys)

Qt
Glacial terrace deposits
(glacial gravel, sand, and silt on terraces of the Missouri River and larger tributaries; some terrace sills non-glacial terrace sills included in mapping)

Qgo
Glacial outwash
(fine sandy clay or silt forming valley grain in Little Heart Butte and vicinity)

Qgt
Glacial till and stratified drift
(unstratified clay sand, gravel, and boulders, probably extra-morainic drift of early Wisconsin age and stratified silt deposited by glacial streams)

Qm
Morainic deposits
(hills of glacial drift generally covered with boulders at surface)

Quaternary

Recent
Tfu
Fort Union formation
(yellow and ash-gray shale and sandstone, overlain in places by glacial boulders and thin mantle of till)

Klc
Lance formation
(dark-colored shale and sandstone containing dinosaur bones; boulders bedrocked in places by glacial till and boulders)

Kfh
Fox Hills sandstone
(yellow to gray cross-bedded sandstone with rusty concretions)

Cretaceous or Tertiary

* Coal mines
x Coal prospects

H.M. Wilson, Geographer.
Robert Muldrow, in charge of section.
Topography by Basil Duke and J.G. Staack.
Triangulation by Missouri River Commission.
Surveyed in 1905.

APPROXIMATE MEAN DECLINATION 1905.

Scale 1:250,000
Miles
Kilometers
Contour interval 50 feet.
Datum is mean sea level.
Edition of Mar. 1911.

DIAGRAM OF TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30
31 32 33 34 35 36

Geology by A.G. Leonard, assisted by W.H. Clark and R.L. Sutherland.
Surveyed in 1909-10.
SURVEYED IN COOPERATION WITH THE STATE OF NORTH DAKOTA.