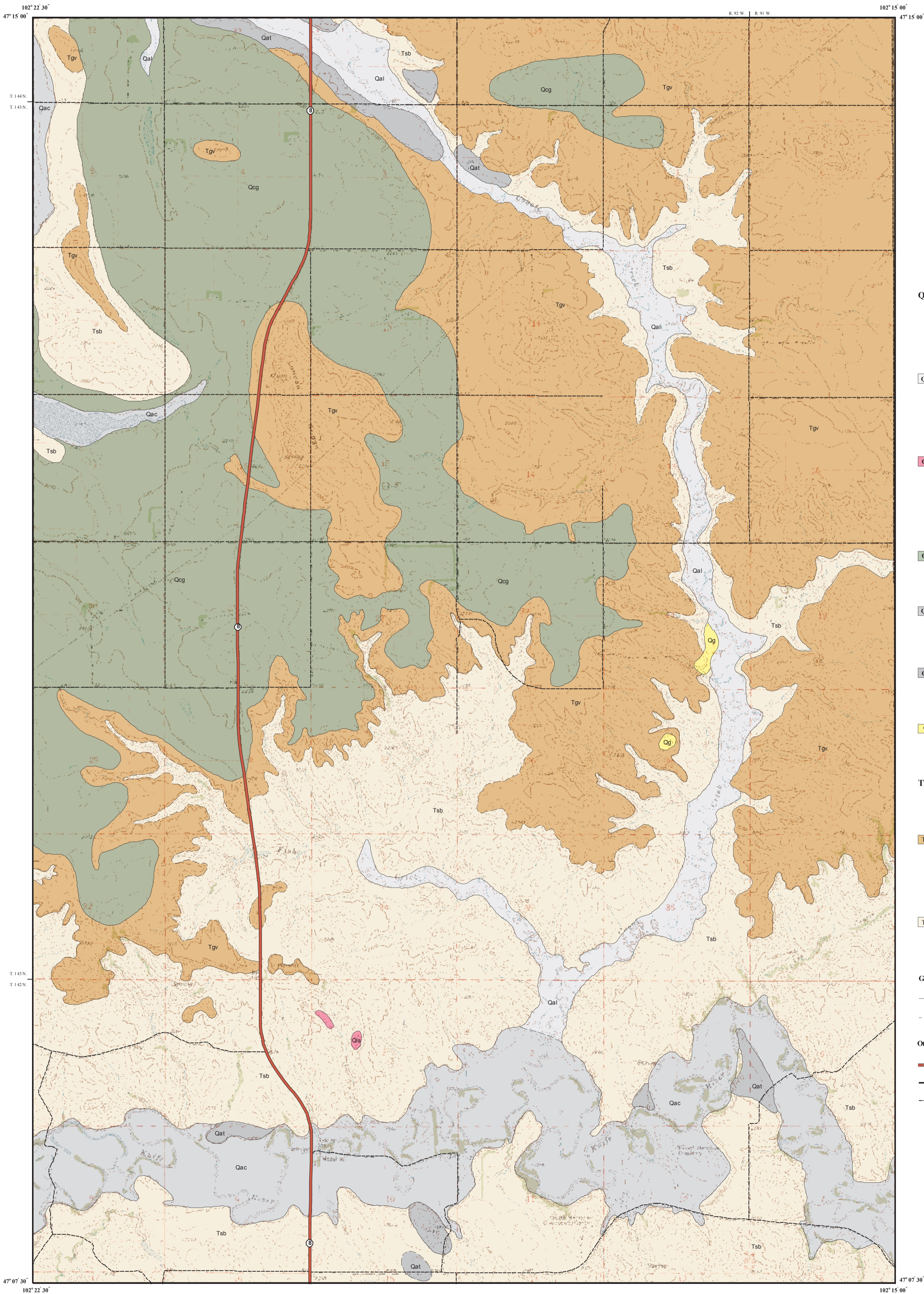


# Surface Geology

## Marshall Quadrangle, North Dakota

**Edward C. Murphy**

2004



### UNIT DESCRIPTIONS

#### QUATERNARY SYSTEM

##### RECENT

##### OAHE FORMATION

**Qal**

**Alluvium**  
Brownish gray to black sand, silt, clay, and lenses of gravel; floodplain deposits (typically less than 30 feet thick) along recent drainages. Not differentiated where it overlies Qac.

##### RECENT/PLEISTOCENE

**Qk**

**Landslide Deposits**  
Variable mixture of strata and deposits that have slid to the base of steep slopes.

##### PLEISTOCENE

##### COLEHARBOR GROUP

**Qcg**

**Glacial Deposits**  
Grayish brown, sandy, silty, bouldery clay with lenses of sand and gravel (glacial till). May occasionally include thick deposits of glacial outwash. Generally preserved as a veneer in the uplands.

**Qac**

**Proglacial Channels**  
Generally contain 50 to 200 feet of sand and gravel, silt, clay, and till (melwater-channel fill). Overlain by Recent alluvium (Qal) of variable thickness. This map unit was created to distinguish between these very thick channel deposits and the moderate to thin deposits mapped as Qal.

**Qat**

**Terrace Deposits**  
Five- to 20-foot-thick layers of sand and gravel (consisting primarily of siltcrete, chert, flint, agate, petrified wood, siltstone) found beneath flat to gently undulating slopes adjacent to many of the major creeks and rivers.

**Qg**

**Sand and Gravel Deposits**  
Layers of sand and gravel found in two primary deposits; as glacial outwash draping over pre-existing topography or as sand and gravel derived primarily from Arikaree and Golden Valley strata, capping narrow, sinuous ridges.

#### TERTIARY SYSTEM

##### EOCENE-PALEOCENE

**Tgv**

**GOLDEN VALLEY FORMATION**  
**Camels Butte Member:**  
Alternating beds of yellowish brown to brown, micaceous sandstone, siltstone, mudstone, claystone, and lignite.  
**Bear Den Member:**  
Brightly colored, kaolinitic claystone, mudstone, and sandstone typically overlain by a thin siliceous bed (siltcrete) or lignite.

**Tsb**

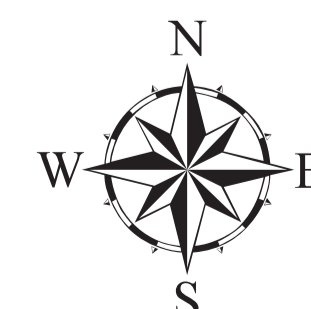
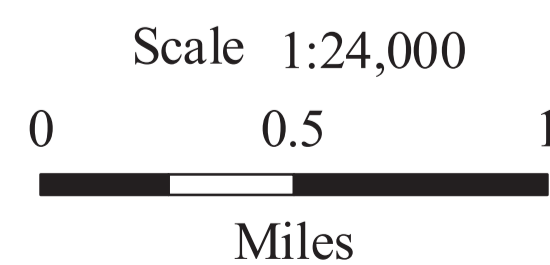
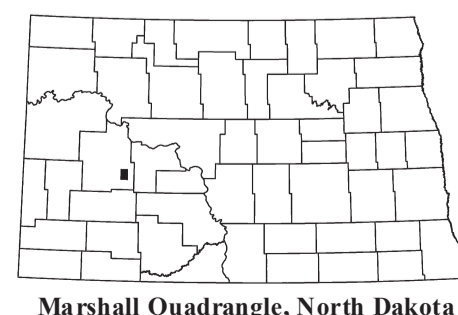
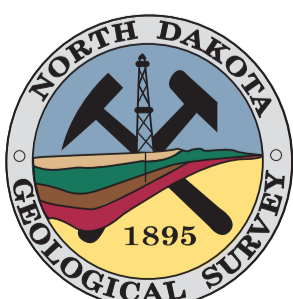
**SENTINEL BUTTE FORMATION**  
Alternating beds of grayish brown to gray sandstone, siltstone, mudstone, claystone, and lignite.

#### Geologic Symbols

- Known contact between two geologic units.
- - - Approximate contact between two geologic units.

#### Other Features

- State Highway
- Paved Road
- Unpaved Road



This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program.