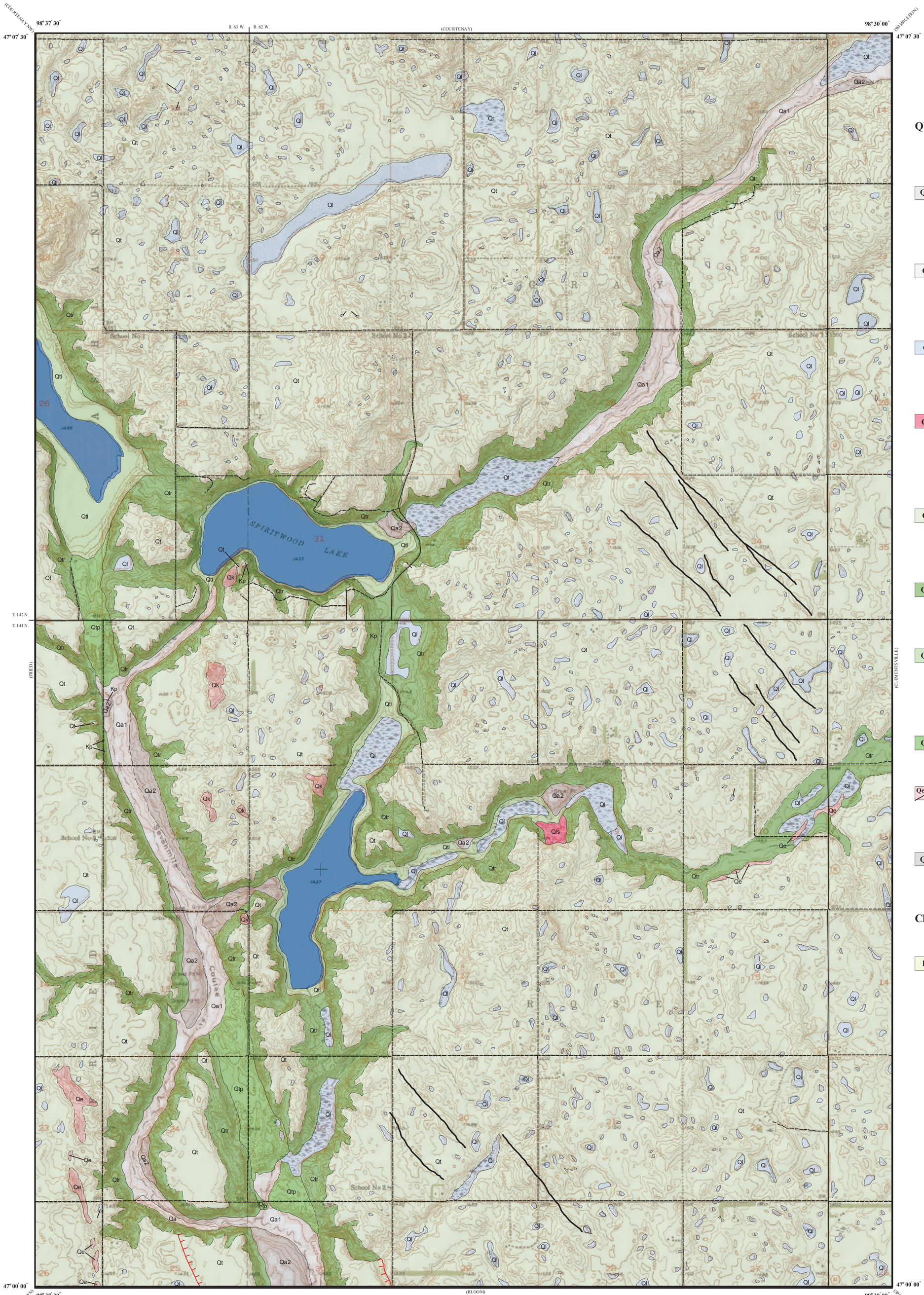
24K: SptL - sg

North Dakota Geological Survey
John P. Bluemle, State Geologist

Surface Geology
Spiritwood Lake Quadrangle, North Dakota



Robert F. Biek
1994

UNIT DESCRIPTIONS

QUATERNARY SYSTEM

RECENT

OAHE FORMATION

Qa1 **Modern River Channel and Overbank Sediment**

Silt, clay, sand, and disseminated organic debris; dark colored; typically very silty and obsurely bedded, locally planar to cross-bedded. Near valley walls commonly overlain by apron of colluvial and slopewash sediment. Deposited in modern river channels and floodplains. Generally less than 12 feet thick.

Qa **Slopewash (Fan Morphology)**

Sand, silt, clay, and gravel derived from river-eroded till; poorly sorted. Forms gently sloping apron that grades into overbank sediments of valley floor. Deposited by alluvial and slopewash processes at base of valley walls. Generally less than 10 feet thick.

Ql **Pond and Slough Sediment**

Silt, clay, and organic debris; planar to obscurely bedded; dark brownish black; typically greenish gray and sandy at base. Deposited in modern ponds and sloughs. Generally less than 6 feet thick.

All maps areas not coded are (Ql) pond and slough sediment.

Qls **Landslide Deposits**

Landslide formed in glacial sediment (till). Characteristic hummocky topography slightly subdued by erosion.

PLEISTOCENE

COLEHARBOR GROUP

Qt **Undisturbed Glacial Sediment (Till)**

Pebbly sand, silt, and clay with abundant cobbles and boulders; unsorted; unbedded; shaly. Surface is gently undulating to hummocky. Deposited by glacial ice; multiple-event deposits as much as 200 feet thick.

Qtr **River-Eroded Glacial Sediment (Till)**

Glacial sediment eroded by meltwater rivers. Veneer of river and slopewash sediment commonly present. River sediments (sand and gravel), and cobble and boulder lag deposits, often exposed on promontories. Forms steep valley walls.

Qtl **Lake-Eroded Glacial Sediment (Till)**

Glacial sediment eroded by wave action along margins of lakes. Thin veneer of slough and nearshore lacustrine sediment commonly present, often as well-developed beaches, beach berms, and beach cusps. Upper contact is sharp and corresponds to maximum high water; it is often marked by a natural rip-rap of glacial erratics. Forms planar surfaces that slope gently lakeward.

Qtp **Palimpsest Glacial Sediment (Till)**

Glacial sediment (till) deposited over and only partly obscurring older glacial features.

Qe / Qk **Ice-Contact Stream-Channel Sediment**

Sand and gravel; moderately to very poorly sorted, locally with inclusions of till; shaly. Deposited by meltwater streams flowing within, on, or under the glacier (eskers) or at or near the ice margin (kames). Up to 30 feet thick.

Qa2 **River Channel Sediment**

River channel sediment as above. Forms level to gently sloping terraces, typically on inside bends of meanders. Deposited by meltwater rivers. As much as 45 feet thick above modern channels.

CRETACEOUS SYSTEM

PIERRE FORMATION

Kp **Marine Offshore Sediment (Bedrock)**

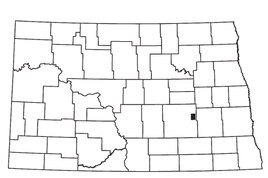
Shale, medium gray to light olive gray, fissile, flaky to blocky, generally non-calcareous. Contains several thin (to 5 centimeters (2 inches)) grayish yellow bentonite beds. Concretions - light olive gray micrite (fine grained, dirty limestone) that weathers to a moderate yellow brown to brownish black, and brownish black to moderate yellowish brown iron-manganese or limonitic concretions - are common along certain horizons. Highly jointed with iron-manganese stains on joint surfaces; joints locally calcite cemented; horizontal bedding locally deformed by glacial ice. Probably about 350 feet thick. (DeGrey Member(?).)

Geologic Symbols

- Known contact between two geologic units
- Approximate contact between two geologic units
- Large abandoned meltwater channel
- Transverse Marginal Ridge (Washboard Moraine)

Other Features

- Water
- Paved Road
- Unpaved Road



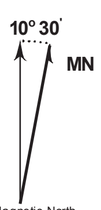
Spiritwood Lake Quadrangle, North Dakota

Scale 1:24,000

0 0.5 1

Miles

Lambert Conformal Conic Projection
1927 North American Datum
Standard Parallels 47° 00' 00" and 47° 07' 30"



1950 Magnetic North
Declination at Center of Sheet

Cartographic Compilation: Elroy L. Kadrmas