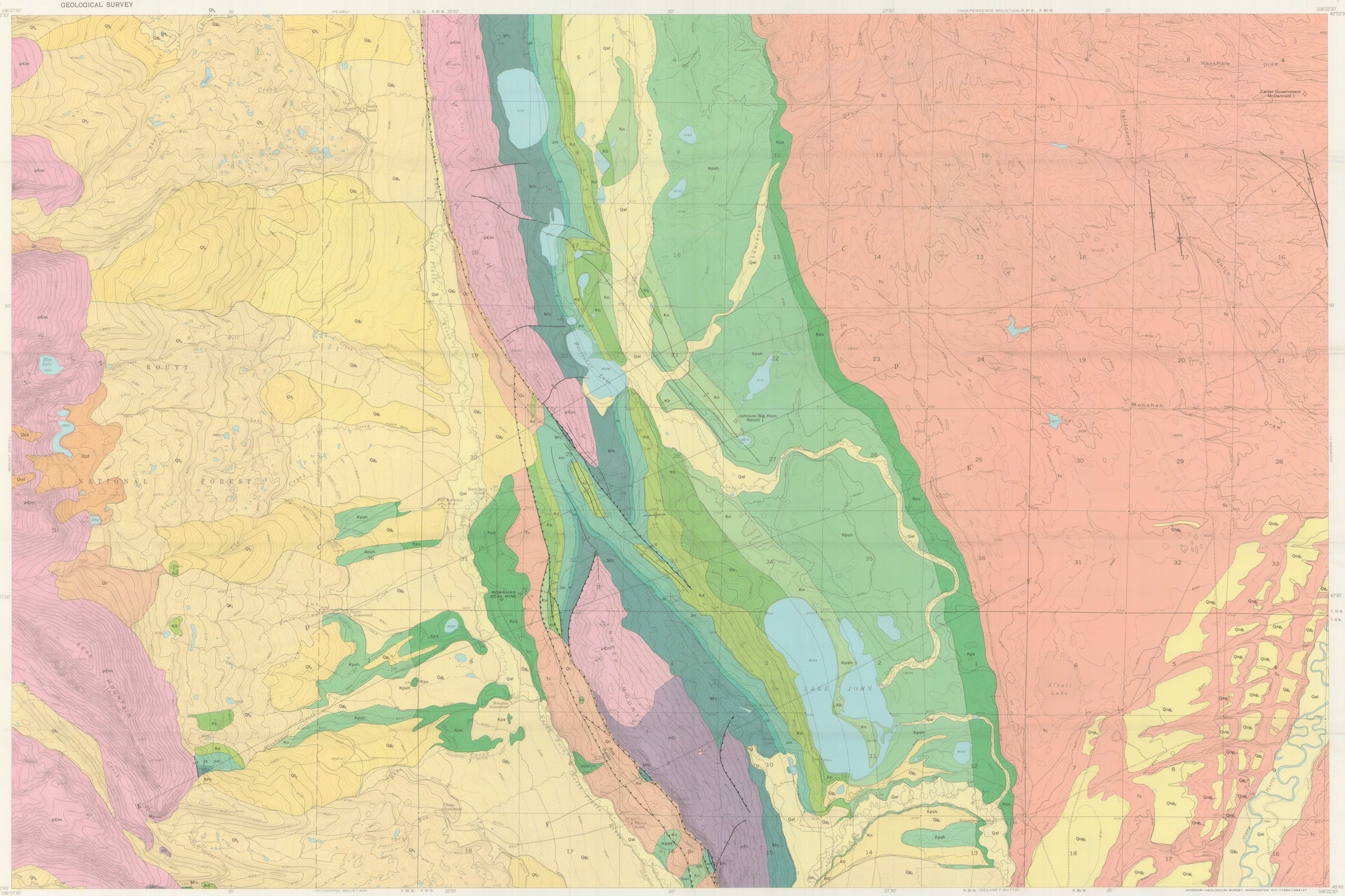

Base from U.S. Geological Survey topographic quadrangles

APPROXIMATE MEAN DECLINATION, 1964

GEOLOGIC MAP OF THE BOETTCHER LAKE AND LAKE JOHN QUADRANGLES, COLORADO

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

EXPLANATION

QUATERNARY

Recent

Qal — **Alluvium**
Flood-plain deposits in present valley bottoms

Neoglaciation

Qcd — **Cirque deposits**
Till within or near existing cirques

Deposits of various ages and stratigraphic positions

Qc — **Colluvium, hillwash, talus, and landslides**
Shown only where extensive, or where significant bedrock geology is covered

Pleistocene

Qt₃ Qg₃ — **Drift of glaciation 3**
Qt₃, *till;* Qg₃, *outwash and glacio-fluvial terrace gravels*

Qt₂ Qg₂ — **Drift of glaciation 2**
Qt₂, *till;* Qg₂, *outwash and glacio-fluvial terrace gravels*

Qog₁ Qog₂ Qog₃ — **Older terrace gravels**
Numbered in order of age: Qog₃ *is oldest*

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TERTIARY

Paleocene and Eocene

Tc — **Coalmont Formation**
Brown to gray feldspathic sandstone, conglomerate, and conglomeratic sandstone; gray, green, and brown sandy claystone; contains some carbonaceous shale and thin coal beds in lower part

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CRETACEOUS

Upper Cretaceous

Kps Kpsh — **Pierre Shale**
Kps, *sandy member; interbedded brown to gray calcareous sandstone, siltstone, and shale; minor clay-pebble conglomerate and coal.*
Kpsh, *shaly member; gray shale, noncalcareous except near base; silty to sandy in upper part*

Kn — **Niobrara Formation**
Mostly calcareous shale; shaly limestone in upper part; basal 20 feet is gray silty limestone

Kb — **Benton Shale**
Interbedded brown sandy limestone, calcareous sandstone and dark calcareous shale in upper part; dark calcareous to noncalcareous shale in middle part; gray, siliceous, platy shale in lower part; thin bentonite beds in lower and middle parts

Lower Cretaceous

Kd — **Dakota Sandstone**
Gray to brown sandstone and dark shale in upper part; sandstone, conglomerate, and locally siltstone and claystone in lower part

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JURASSIC

Upper Jurassic

Jm — **Morrison Formation**
Varicolored shale and claystone, and lenticular brown sandstone; thin limestone bed at base

Js — **Sundance Formation**
Gray to green glauconitic sandstone and shale in upper part; light-gray sandstone in lower part

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PERMIAN AND TRIASSIC

ꟾPc — **Chugwater Formation**
Red shale, siltstone, and sandstone

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PRECAMBRIAN

p-Ci — **Intrusive granitic rocks**
Mostly quartz monzonite

p-Cm — **Metamorphic rocks**
Mostly hornblende, biotite, and felsic gneiss

(Kn) / (Kpsh) — **Contact**
Dashed where approximately located; dotted where concealed (not necessarily shown beneath all surficial deposits). Formation symbols in parentheses adjacent to dotted contacts show bedrock formations beneath surficial deposit

U D — **High-angle fault**
Dashed where approximately located; dotted where concealed (not necessarily shown beneath all surficial deposits). U, upthrown side; D, downthrown side

Reverse or thrust fault
Dashed where approximately located; dotted where concealed (not necessarily shown beneath all surficial deposits). Sawteeth are on upper plate

Anticline
Showing crestline. Dashed where approximately located; dotted where concealed

Syncline
Showing trough line. Dashed where approximately located; dotted where concealed

25 — **Strike and dip of beds**

32 — **Strike and dip of overturned beds**

70 — **Strike and dip of foliation**

50 — **Strike of vertical foliation**

Abandoned mine

U — **Mineral prospect**
U, *uranium.*
M, *other minerals*

Dry hole

Geology by W. J. Hail, Jr., 1956–58; assisted by L. D. Taylor, 1958

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1964—G64127