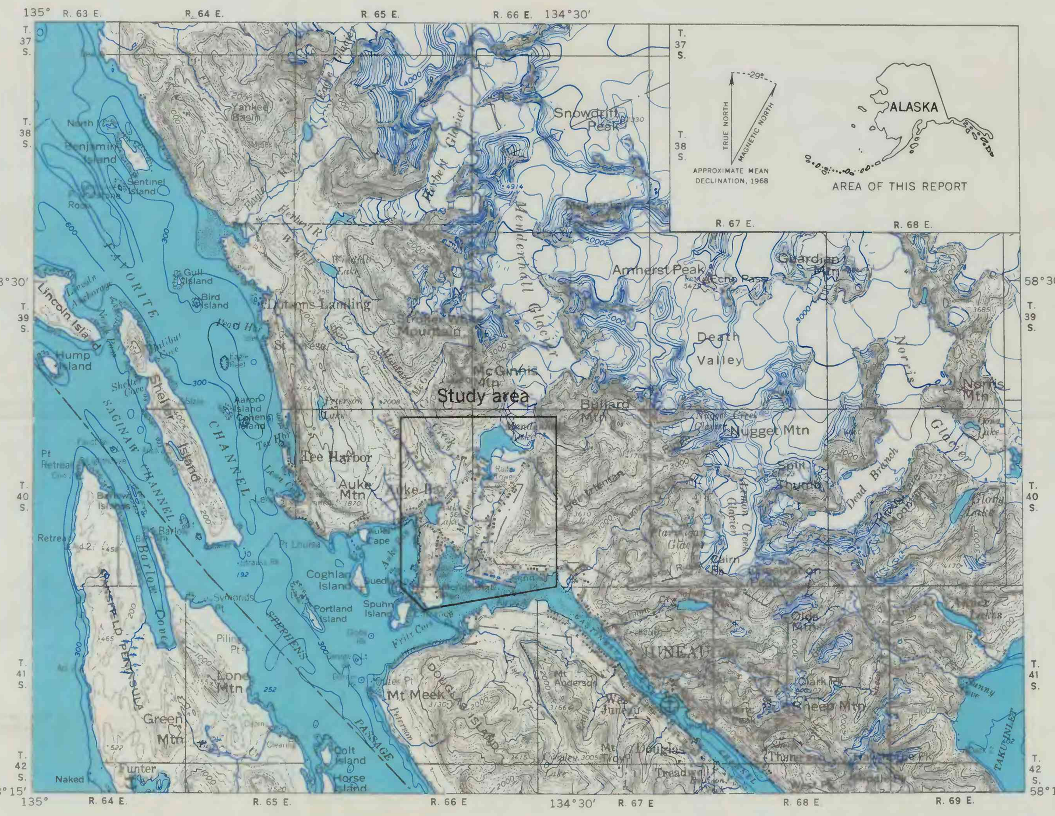
PREPARED IN COOPERATION WITH THE
GREATER JUNEAU BOROUGH, ALASKA



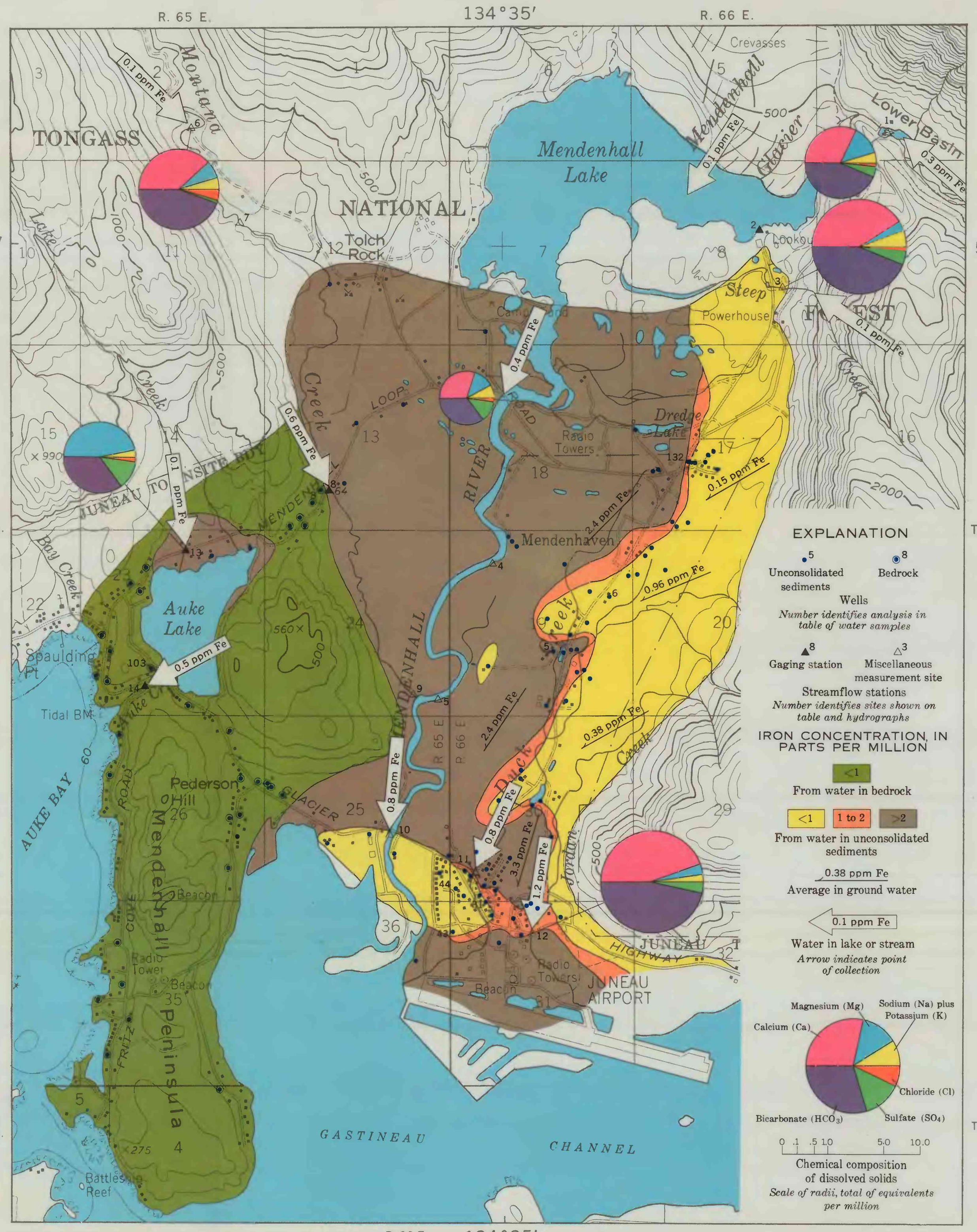
Base from U.S. Geological Survey, Juneau, 1:250,000; 1962

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

INDEX MAP

AREAL VIEW OF MENDENHALL VALLEY, MENDENHALL GLACIER IN THE BACKGROUND, SEPTEMBER 1966

PANORAMIC VIEW OF THE MENDENHALL GLACIER TERMINUS, APRIL 1966



EXPLANATION

Wells: Unconsolidated sediments; Bedrock
Number identifies analysis in table of water samples

Gaging station; Miscellaneous measurement site

Streamflow stations
Number identifies sites shown on table and hydrographs

IRON CONCENTRATION, IN PARTS PER MILLION

<1 — From water in bedrock

<1; 1 to 2; >2 — From water in unconsolidated sediments

0.38 ppm Fe — Average in ground water

0.1 ppm Fe — Water in lake or stream
Arrow indicates point of collection

Magnesium (Mg); Sodium (Na) plus Potassium (K); Calcium (Ca); Chloride (Cl); Bicarbonate (HCO_3); Sulfate (SO_4)

Chemical composition of dissolved solids
Scale of radii, total of equivalents per million

Base from U.S. Geological Survey, Juneau (B-2), 1:63 360, 1962

Geology by W. W. Barnwell and D. A. Sommers, 1965

SCALE 1:31 680

CONTOUR INTERVAL 100 FEET
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DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
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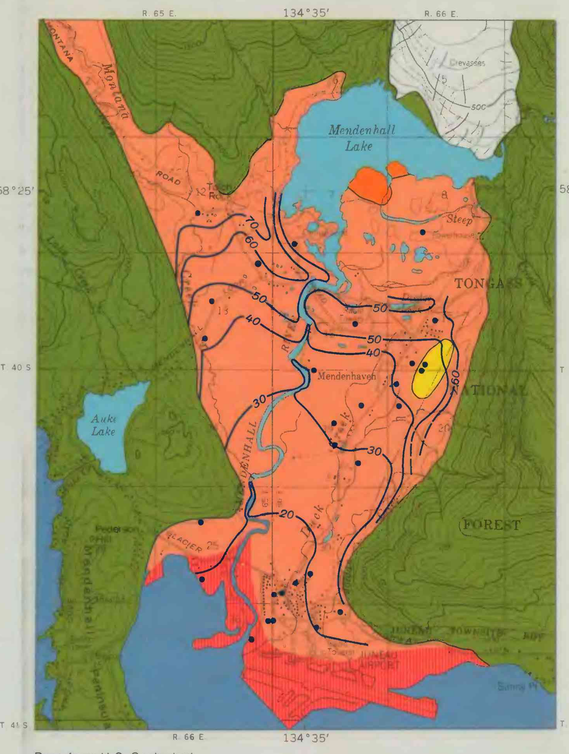
THE MEAN RANGE OF TIDE IS APPROXIMATELY 14 FEET

QUALITY OF SURFACE AND GROUND WATERS MAP



Base from U.S. Geological Survey, Juneau (B-2), 1962

SCALE 1:63 360

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EXPLANATION

Ice

Fresh-water lake or stream

Salt or brackish surface water

Area where ground water is obtained from bedrock

Area where ground water is obtained from unconsolidated sediments
Pattern indicates area where shallow wells yield brackish water

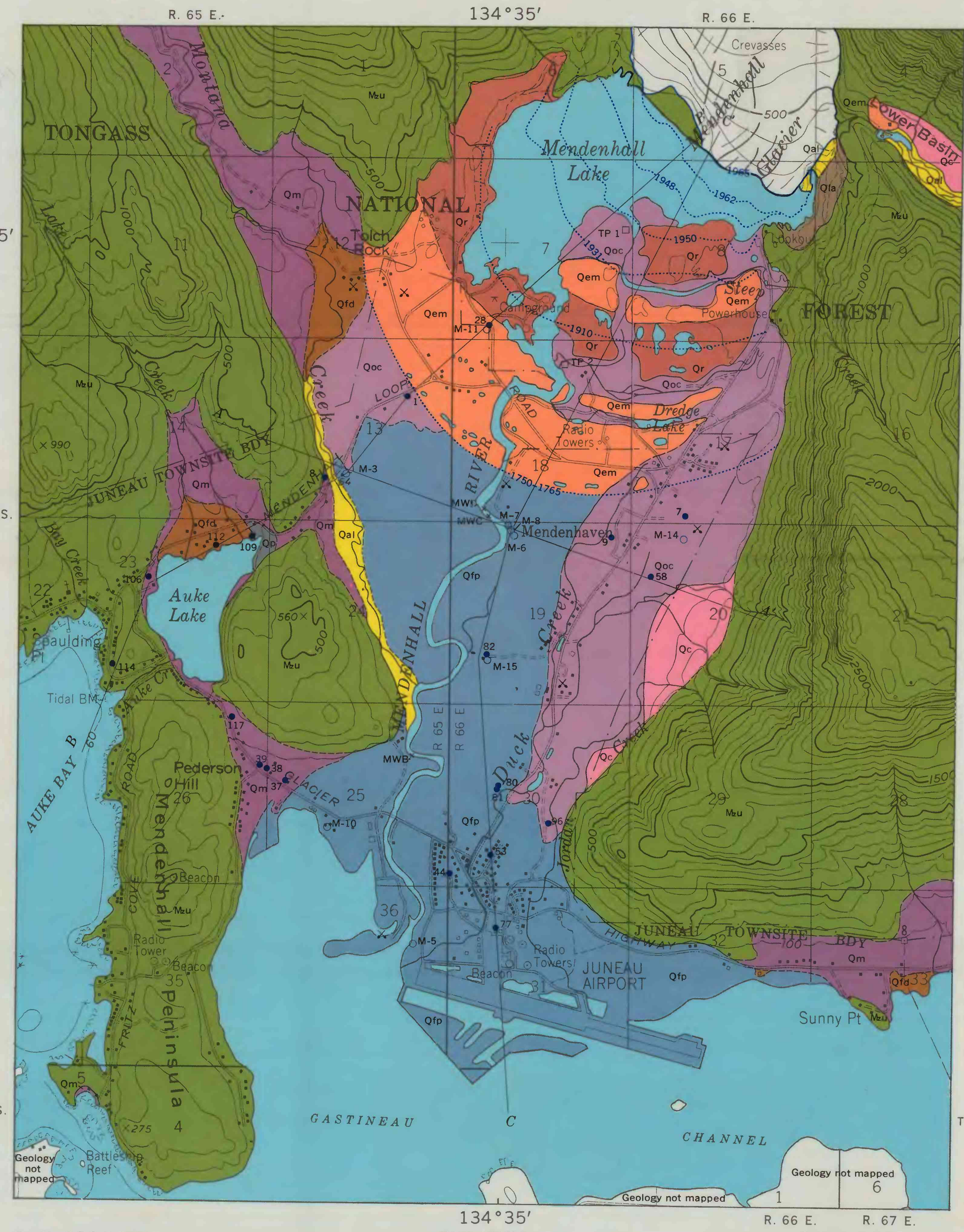
Area favorable for the construction of galleries

Area favorable for large capacity water wells

Well used for control

Water-level contour
Shows altitude of water level above mean lower low water. Contour interval 10 feet

OCCURRENCE OF WATER AND ICE MAP



Base from U.S. Geological Survey, Juneau (B-2), 1:63 360, 1962

Geology by W. W. Barnwell and D. A. Sommers, 1965
Bedrock geology, in part, after Knopf, 1912

SCALE 1:31 680

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EXPLANATION

GEOLOGIC FORMATIONS AND THEIR WATER-BEARING PROPERTIES

QUATERNARY — Recent

Qal — **Alluvial deposits**
Sand and gravel, well washed and sorted by stream action, better than average permeability, will yield moderate supplies of water

Qp — **Peat**
Deposited marginally to Auke Lake as much as 60 feet thick. Not water bearing

Qc — **Colluvial deposits**
Landslide and talus deposits, chiefly very coarse boulders and rock fragments, poorly sorted. Not a source of water

Qfp — **Flood-plain and outwash deposits**
Silt and sand, locally gravel and peat, yield moderate quantities of water having iron content more than 3 ppm and high silt content. Relatively impermeable

Qoc — **Abandoned outwash channel deposits**
Sand and gravel, locally boulders, predominantly younger than A. D. 1750, are best aquifers in valley. May produce large quantities of water having relatively low iron content

Qfd — **Alluvial fan and delta deposits**
Sand and gravel, locally silt and clay, yield moderate quantities of water

Qr — **Glacier recessional deposits**
Silty sand and gravel yield moderate quantities of water. Include some outwash or alluvial deposits and contain permeable sands in abandoned stream channels

Qem — **End-moraine deposits**
Cobbles, gravel, and silty sand, predominantly coarse and poorly sorted, yield moderate quantities of water

QUATERNARY — Pleistocene

Qla — **Lateral glacier margin deposits**
Silty gravel and sand, locally coarse boulders, probably yield moderate quantities of water. No known wells

Qm — **Alluvial, estuarine, and marine deposits**
Gradational from fossiliferous, older (late Wisconsin) clay, sand, gravel, and boulders, which generally are not water bearing, to younger (Recent) deposits of clay, silt, and sand, which yield moderate quantities of water

UNCONFORMITY

MESOZOIC

Mzu — **Metamorphic rocks of igneous and sedimentary origin**
Greenstone, graywacke, argillite, slate, quartz, diorite, and gneiss. Average yield 3 gpm or less

Contact
Dashed where approximately located; short dashed where inferred

Gravel pit

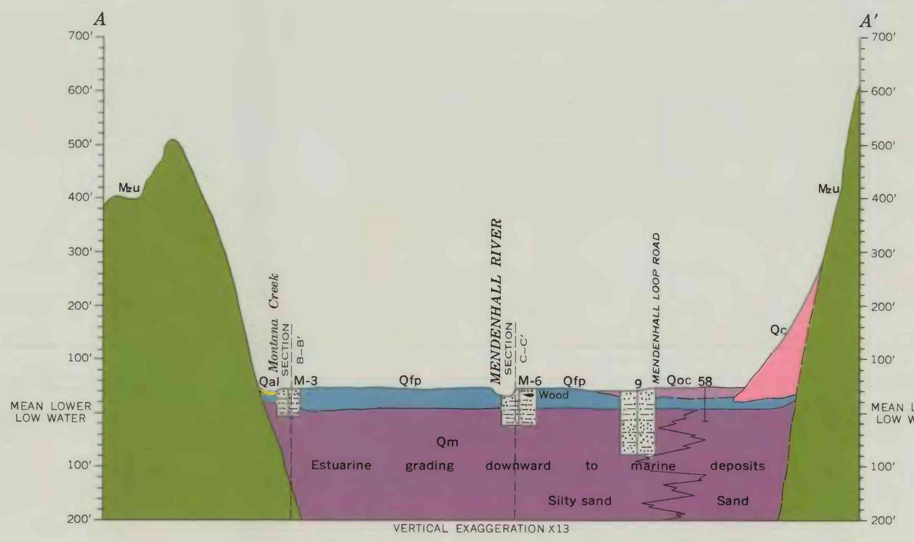
1962 — Position of glacier front at specified year
Dotted where inferred

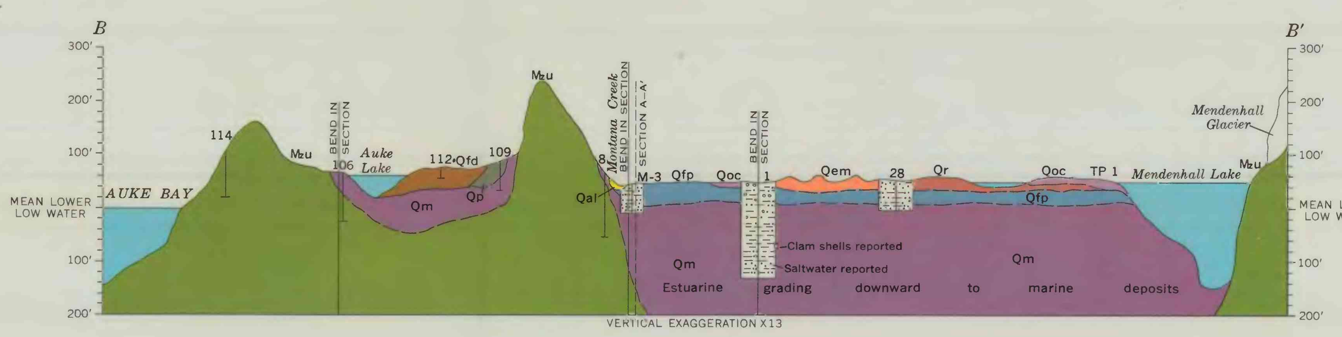
77 — Well

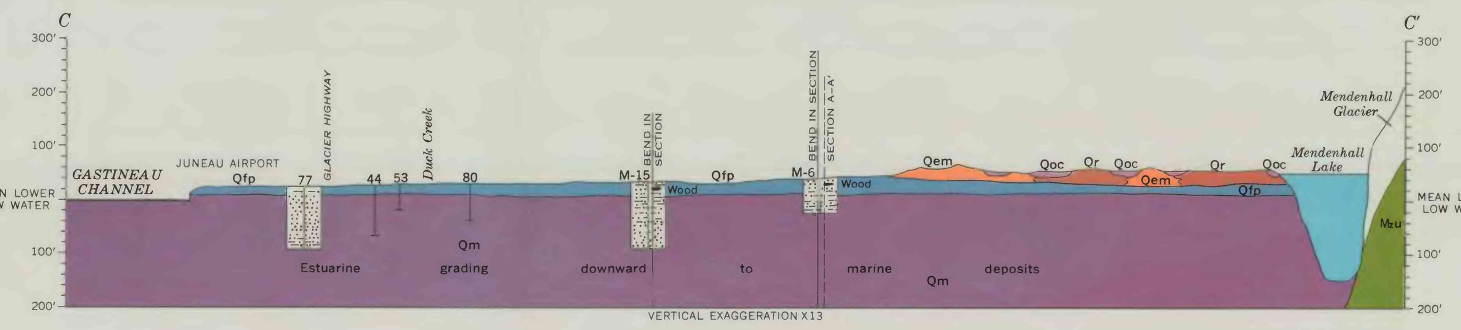
M-11 — Test hole

MWD — Wood sample

TP 1 — Test pit

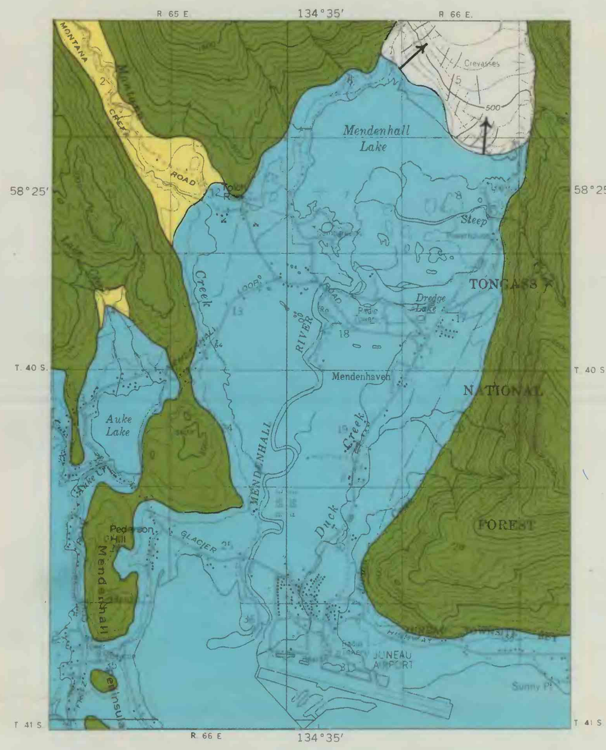




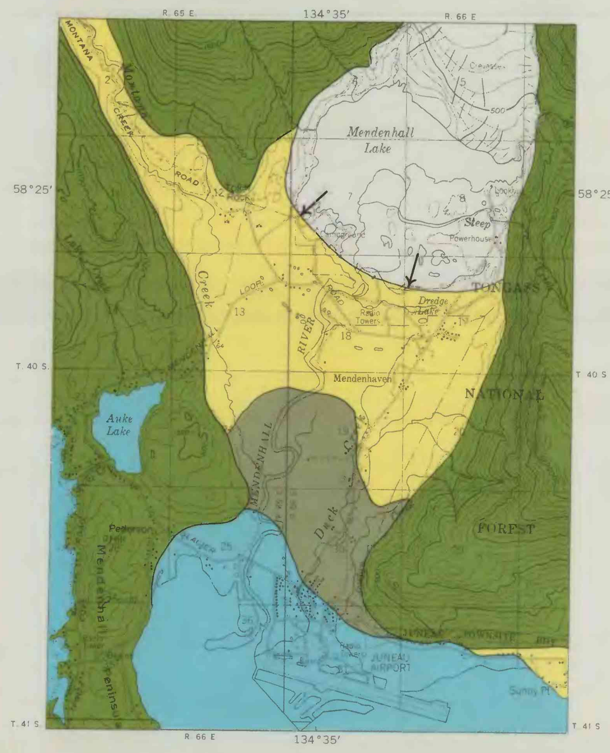


SURFICIAL GEOLOGIC MAP AND SECTIONS

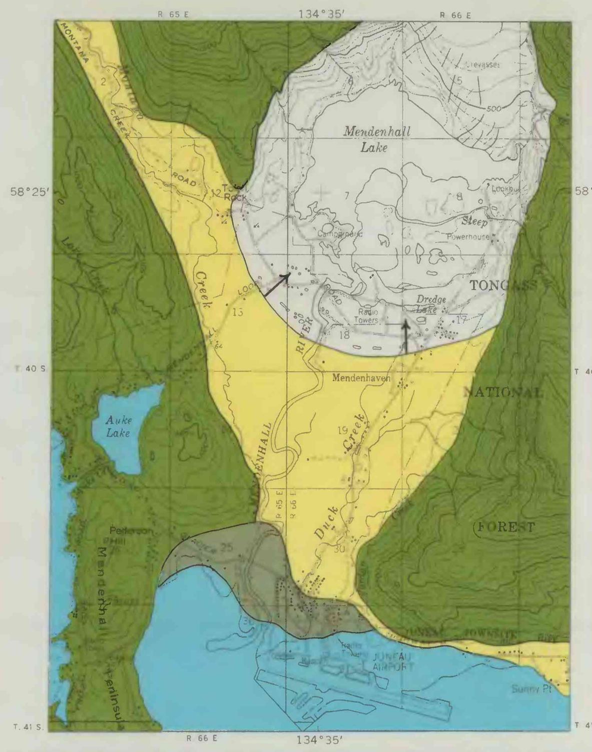
PUMPING FROM TEST PIT NO. 1 NEAR MENDENHALL LAKE IN APRIL 1966



MARINE PHASE (10,000–4500 B. C.)



ESTUARINE AND NONMARINE PHASE (4500 B. C.–A. D. 1750)



NONMARINE PHASE (A. D. 1750 TO PRESENT)

EXPLANATION

Ice

Marine deposition

Nonmarine deposition

Estuarine deposition

Upland erosion

Glacial advance

Glacial recession

Base from U.S. Geological Survey, Juneau (B-2), 1962

SCALE 1:63 360

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PALEOGEOGRAPHIC MAPS

WATER RESOURCES AND SURFICIAL GEOLOGY OF THE MENDENHALL VALLEY, ALASKA

By
William W. Barnwell and Charles W. Boning

1968

INTERIOR—U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C.—1968—W67112

For sale by U.S. Geological Survey, price 75 cents