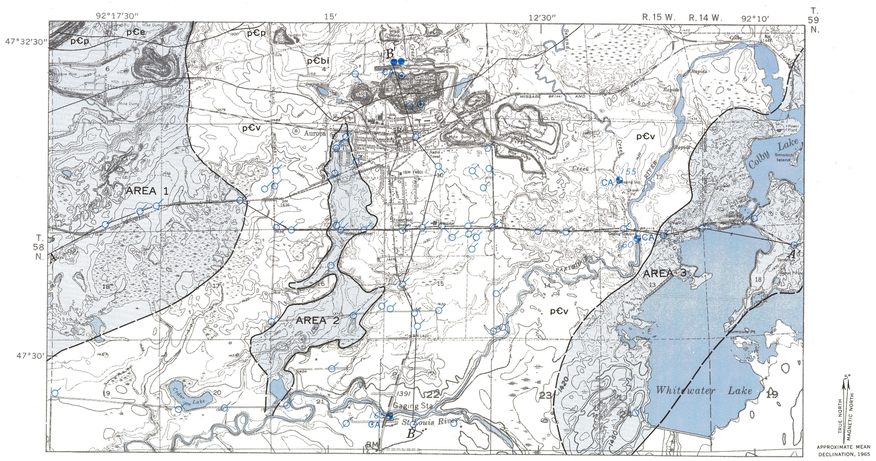
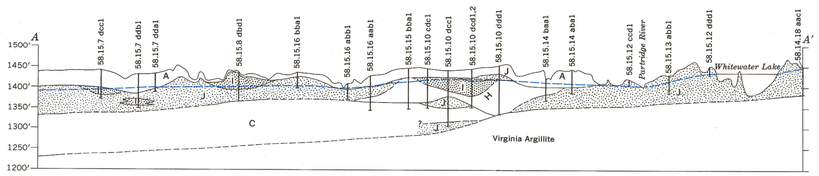
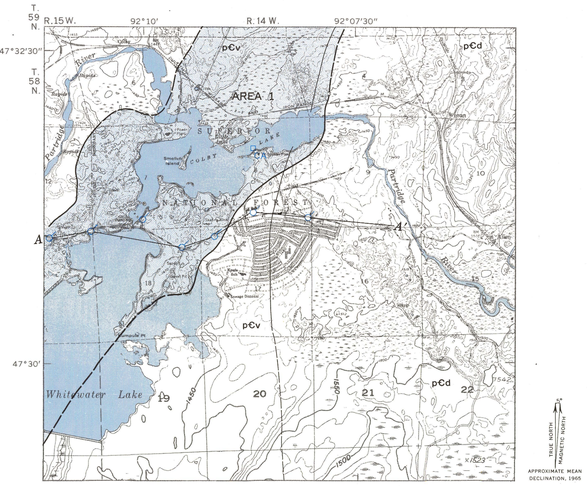


Base from U.S. Geological Survey topographic quadrangles: Aurora, 1949, Biwabik, 1950, Markham, 1957, and Palo, 1951

Bedrock contacts from Schwartz (1956, pl. 3), and unpublished Oliver Iron Mining Division maps. Geologic nomenclature from Goldich and others (1961, table 2)

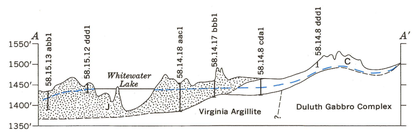


AURORA AND VICINITY

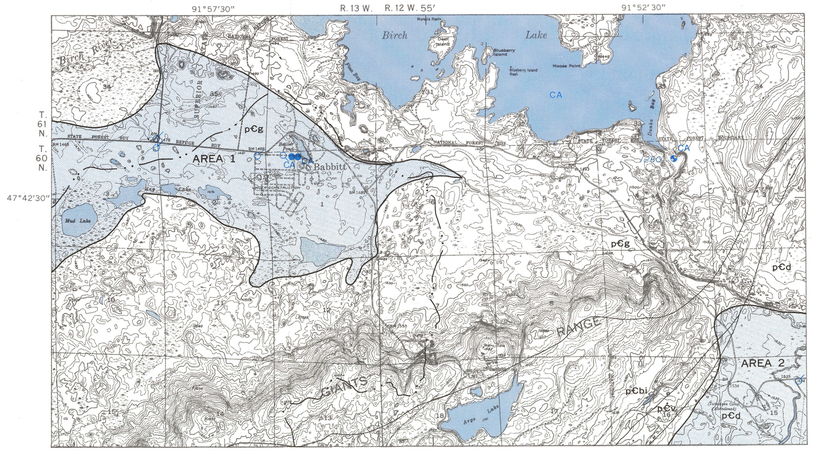


Base from U.S. Geological Survey topographic quadrangles: Allen, 1954, Aurora 1949, and Markham, 1957

Bedrock contacts from Henderson and Meuschke (1952), Schwartz (1956 pl. 3), and unpublished Oliver Iron Mining Division maps. Geologic nomenclature from Goldich and others (1961, table 2)



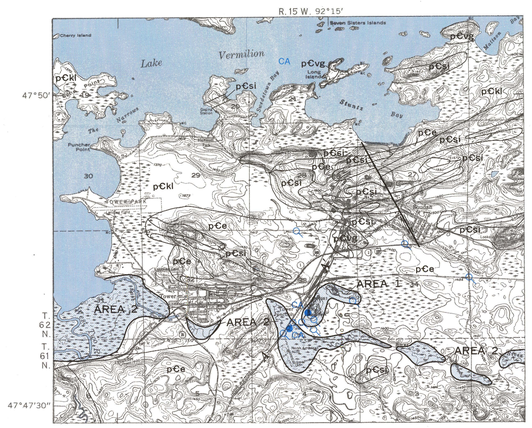
HOYT LAKES AND VICINITY



Base from U.S. Geological Survey topographic quadrangles: Babbitt, 1951, and Babbitt NE, 1952

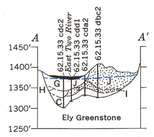
Bedrock contacts from Schwartz (1956, fig. 13, p. 92, and pl. 3), and unpublished Oliver Iron Mining Division maps. Geologic nomenclature from Goldich and others (1961, table 2)

BABBITT AND VICINITY

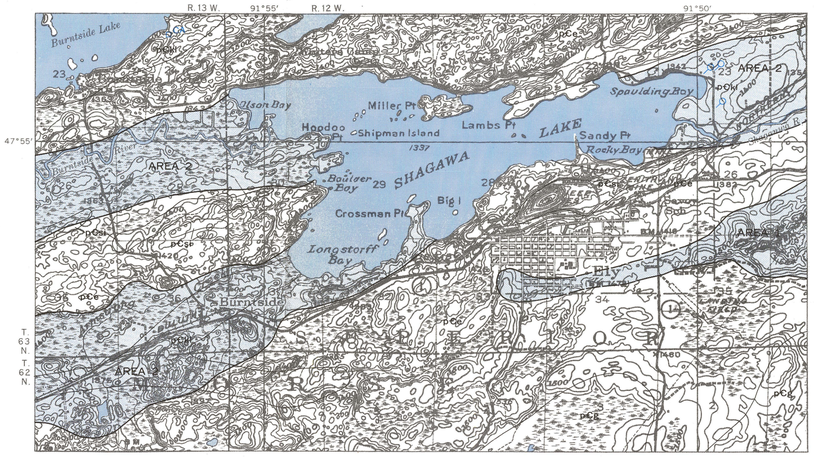


Base from U.S. Geological Survey topographic quadrangles: Soudan 1956, and Tower, 1956

Bedrock contacts from Schwartz (1956, pl. 2). Geologic nomenclature from Goldich and others (1961, table 2)



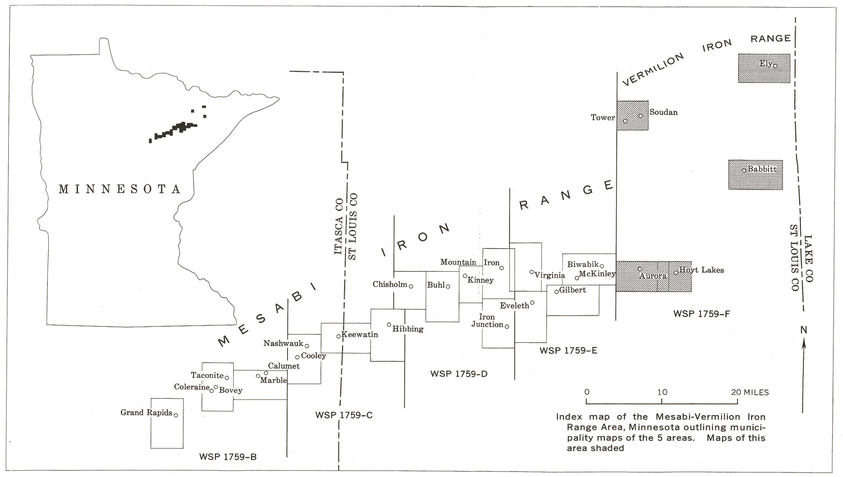
SOUDAN, TOWER, AND VICINITY



Base from U.S. Geological Survey topographic quadrangle: Ely, 1933

Bedrock contacts from Schwartz (1956, fig. 16, p. 104, and pl. 2). Geologic nomenclature from Goldich and others (1961, table 2)

ELY AND VICINITY



Index map of the Mesabi-Vermilion Iron Range Area, Minnesota outlining municipality maps of the 5 areas. Maps of this area shaded

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 10 AND 20 FEET
DATUM IS MEAN SEA LEVEL

BEDROCK GEOLOGY

PRECAMBRIAN

Upper Precambrian — Keweenawan Series
- pCd — Duluth Gabbro Complex

UNCONFORMITY

Middle Precambrian — Animikie Group
- pCv — Virginia Argillite
- pCbi — Biwabik Iron-Formation
- pCp — Pokegama Quartzite

UNCONFORMITY

Lower Precambrian
- pCvg — Vermilion Granite
- pCg — Giants Range Granite
- pCkl — Knife Lake Group undivided

UNCONFORMITY

- pCsi — Soudan Iron-Formation
- pCe — Ely Greenstone

EXPLANATION

Contact
Dashed where inferred

Fault, showing relative movement

A A′
Trace of geologic section

Laurentian Drainage Divide

AREA 1
Area of potential ground-water development from glacial drift
Boundary dashed where indefinite

Municipal well

Industrial well

USGS test hole

Municipal test hole and (or) abandoned well

Department of Iron Range Resources and Rehabilitation test hole

150
Stream-gaging station and identification number

Surface-water pumping station

CA
Chemical analysis
See text

SECTIONS

LITHOLOGIC SYMBOLS

Swamp deposits

A — Till, clayey, reddish-brown to brownish-gray

C — Till, sandy, gravelly, bouldery, gray to brown

G — Clay; silty to sandy clay

H — Silt; clayey to sandy silt

Sand; clayey to silty sand

Sand and gravel; silty sand and gravel

Piezometric surface
Widely spaced where indefinite

Vertical exaggeration of sections ×20

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1965—W65047

HYDROGEOLOGIC MAPS OF MUNICIPALITY AREAS IN THE EASTERN MESABI IRON RANGE AND VERMILION IRON RANGE, NORTHEASTERN MINNESOTA