

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

















**GEOLOGIC MAP OF THE TOWER QUADRANGLE,
ST. LOUIS COUNTY, MINNESOTA**

**By R. W. Ojakangas, P. K. Sims,
and P. R. Hooper**


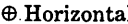


MINNESOTA GEOLOGICAL SURVEY

GEOLOGIC QUADRANGLE MAP
Published by the U.S. Geological Survey, 1978
G




GEOLOGIC MAP SYMBOLS
COMMONLY USED ON MAPS OF THE UNITED STATES GEOLOGICAL SURVEY
(Special symbols are shown in explanation)

	Contact—Dashed where approximately located; short dashed where inferred; dotted where concealed
	Contact—Showing dip; well exposed at triangle
	Fault—Dashed where approximately located; short dashed where inferred; dotted where concealed
	Fault, showing dip—Ball and bar on downthrown side
	Normal fault—Hachured on downthrown side
	Fault—Showing relative horizontal movement
	Thrust fault—Sawteeth on upper plate
	Anticline—Showing direction of plunge; dashed where approximately located; dotted where concealed
	Asymmetric anticline—Short arrow indicates steeper limb
	Overturned anticline—Showing direction of dip of limbs
	Syncline—Showing direction of plunge; dashed where approximately located; dotted where concealed
	Asymmetric syncline—Short arrow indicates steeper limb
	Overturned syncline—Showing direction of dip of limbs
	Monocline—Showing direction of plunge of axis
	Minor anticline—Showing plunge of axis
	Minor syncline—Showing plunge of axis

Strike and dip of beds—Ball indicates top of beds known from sedimentary structures

 70° Inclined  Horizontal
 Vertical  40° Overturned




Strike and dip of foliation

 20° Inclined  Vertical  Horizontal


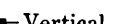

Strike and dip of cleavage

 15° Inclined  Vertical  Horizontal

Bearing and plunge of lineation



 15° Inclined  Vertical  Horizontal

Strike and dip of joints

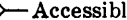

 40° Inclined  Vertical  Horizontal

Note: Planar symbols (strike and dip of beds, foliation or schistosity, and cleavage) may be combined with linear symbols to record data observed at same locality by superimposed symbols at point of observation. Coexisting planar symbols are shown intersecting at point of observation.

Shafts

 Vertical  Inclined

Adit, tunnel, or slope

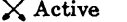
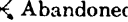
 Accessible  Inaccessible

X Prospect


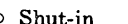





Quarry

 Active  Abandoned

Gravel pit

 Active  Abandoned

Oil wells

 Drilling  Shut-in  Dry hole, abandoned
 Gas  Show of gas
 Oil  Show of oil