




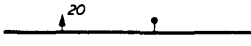




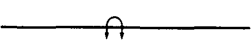



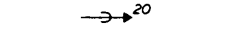



DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

**GEOLOGIC MAP OF THE GREAT FALLS
QUADRANGLE, MONTANA**

By Richard W. Lemke

GEOLOGIC QUADRANGLE MAP
Published by the U. S. Geological Survey, 1977
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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
	Overtured 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
	Overtured 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

$\frac{70}{\text{---}}$ Inclined \oplus Horizontal
 $\text{---} \perp$ Vertical $\frac{40}{\text{---}}$ Overtured

Strike and dip of foliation

$\frac{20}{\text{---}}$ Inclined $\text{---} \blacklozenge$ Vertical $\text{---} \perp$ Horizontal

Strike and dip of cleavage

$\frac{15}{\text{---}}$ Inclined $\text{---} \text{---}$ Vertical $\text{---} \perp$ Horizontal

Bearing and plunge of lineation

$\frac{15}{\text{---}}$ Inclined $\text{---} \blacklozenge$ Vertical $\text{---} \longleftrightarrow$ Horizontal

Strike and dip of joints

$\frac{40}{\text{---}}$ Inclined $\text{---} \blacklozenge$ Vertical $\text{---} \perp$ 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

\blacksquare Vertical \blacksquare Inclined

Adit, tunnel, or slope

$\text{---} \text{---}$ Accessible $\text{---} \text{---}$ Inaccessible

X Prospect

Quarry

\times Active \times Abandoned

Gravel pit

\times Active \times Abandoned

Oil wells

\circ Drilling ϕ Shut-in ϕ Dry hole, abandoned
 \star Gas \star Show of gas
 \bullet Oil \bullet Show of oil