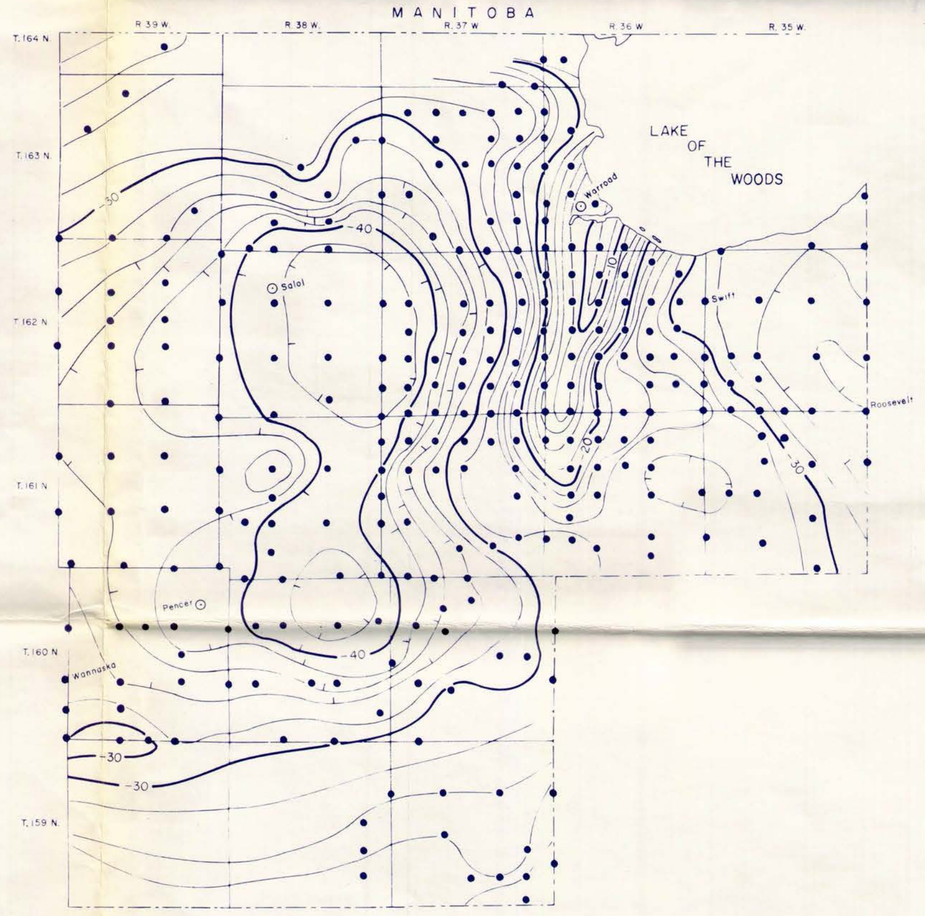
SIMPLE BOUGUER GRAVITY



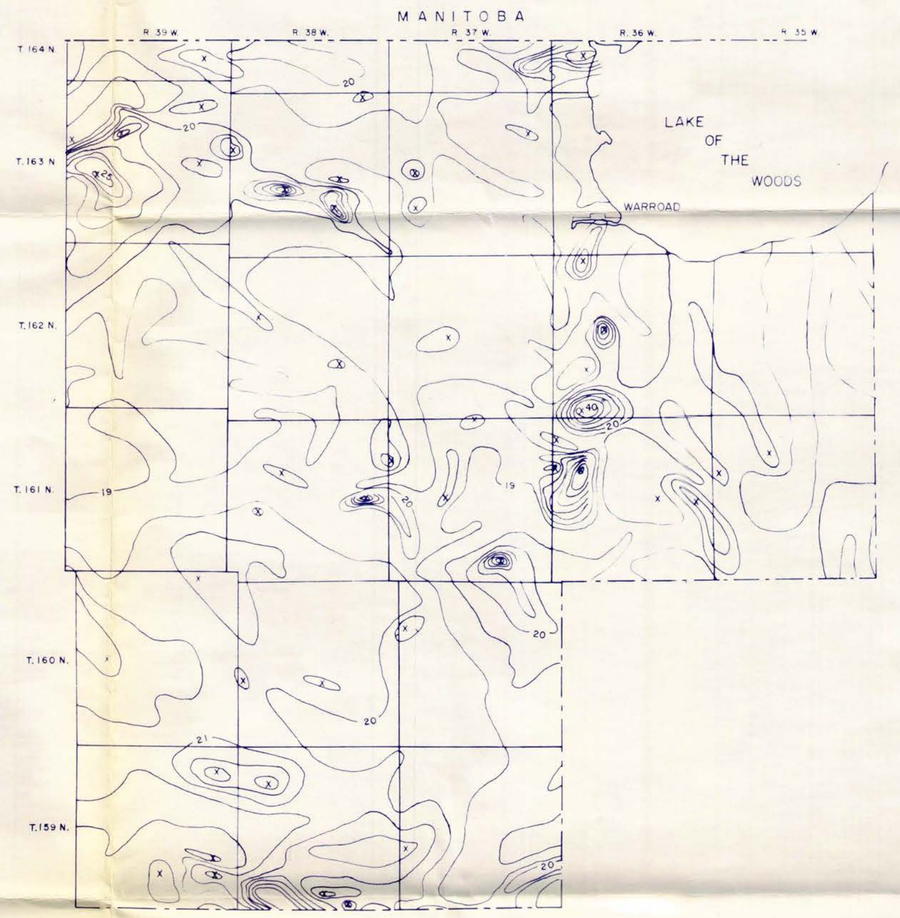
EXPLANATION

Gravity from McGinnis, Durfee and Ikola (1973) (Ref. 5)

-30 Gravity contours; 2 milligal contour interval; assumed densit 2.67 grams per cubic centimeter

Gravity station

AEROMAGNETICS



EXPLANATION

Aeromagnetics from Bath, Schwartz and Gilbert (1964) (Ref. 1).

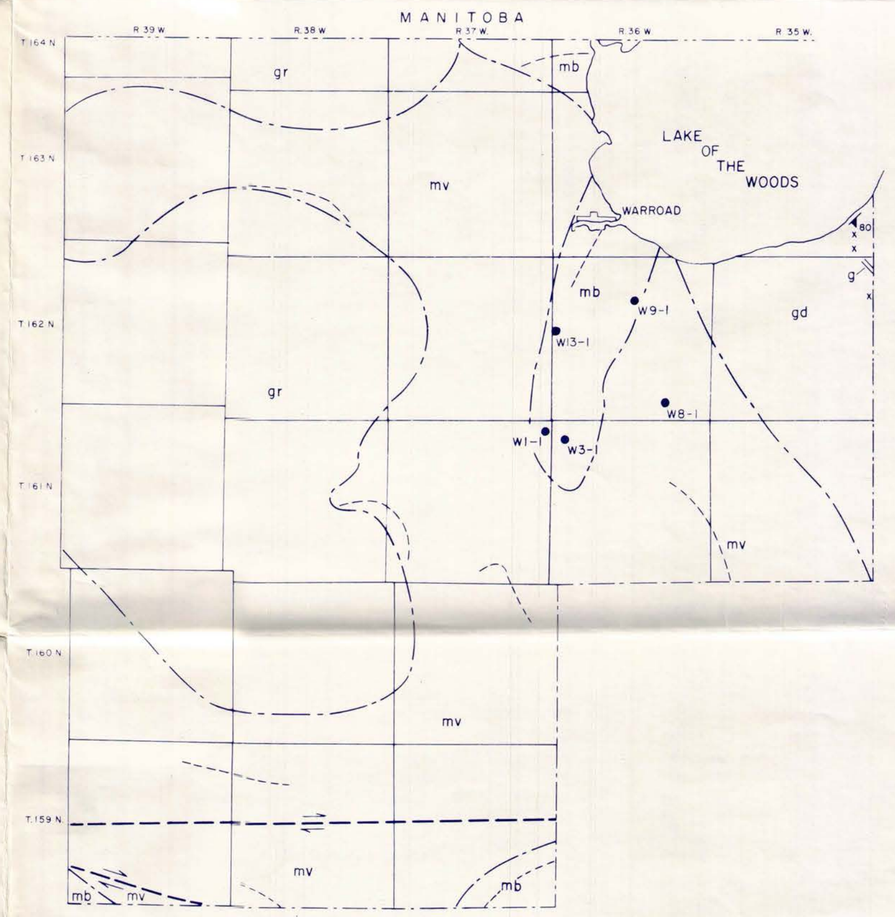
20 Magnetic contours showing total intensity magnetic field of earth in hundreds of gammas relative to arbitrary datum, hachured indicates closed areas of lower magnetic intensity.

x Measured maximum or minimum intensity within closed high or low

Total-intensity aeromagnetic data were obtained by flying north-south lines spaced one mile apart at an altitude of 900 to 1,100 feet east of Warroad and 500 feet west of Warroad. Bird was towed 75 feet below aircraft (Refs. 2 and 6).

For detailed maps (1:63,360) and profiles of aeromagnetic survey, see References 2 and 6.

PRECAMBRIAN GEOLOGY



EXPLANATION

Geology from Sims and Ojakangas (1973) (Ref. 8) with modifications based on recent drilling.

g Dike, diabasic gabbro and diorite having chilled margins

LOWER PRECAMBRIAN

gr Granitic rocks, undivided (probably intermediate in composition)

gd Granodiorite and related rocks

METAVOLCANIC ROCKS

mb mv

mb- Dominantly basaltic lavas and associated synvolcanic rocks; includes some volcaniclastics; includes ultramafics south of Warroad

mv- Dominantly volcaniclastic rocks of both mafic and felsic compositions; includes basaltic lavas

Contact, inferred largely from aeromagnetic and gravity data

High angle fault, showing inferred horizontal movement, inferred largely from aeromagnetic and gravity data

Trend of airborne magnetic anomaly, from aeromagnetic map on this sheet and References 2 and 6

80 Strike and dip of foliation

x Rock Outcrop

W3-1 Vertical diamond drill hole, with hole number

Area covered by Quaternary deposits of peat, sand, clay and silt (Refs. 4 and 9). Probably Cretaceous rocks (clay, sand and lignite) occur in local depressions in Precambrian rocks (Ref. 2). Thickness of Quaternary-Cretaceous deposits generally less than 200 feet, often less than 100 feet (Ref. 7).

REFERENCES

1. Bath, G. D., Schwartz, G. M. and Gilbert, F. P., 1964, Aeromagnetic and Geologic Map of Northwestern Minnesota: Map GP-471, U. S. Geological Survey.
2. Books, K. G., Schwartz, G. M., Meuschke, J. L. and Dempsey, W. J., 1958, Aeromagnetic Map of Eastern Roseau County, Minnesota: Map GP-140, U. S. Geological Survey.
3. Division of Minerals, Minnesota Department of Natural Resources, Files.
4. Helgesen, J. O., Lindholm, G. F. and Ericson, D. W., 1975, Water Resources of the Lake of the Woods Watershed, North-Central Minnesota: Atlas HA-544, U. S. Geological Survey.
5. McGinnis, L., Durfee, G. and Ikola, R. J., Simple Bouguer Gravity Map of Minnesota - Roseau Sheet, Map M-12, Minnesota Geological Survey.
6. Meuschke, J. L., Books, K. G., Henderson, John R. Jr. and Schwartz, G. M., 1957, Aeromagnetic and Geologic Map of Northern Lake of the Woods and Northeastern Roseau Counties, Minnesota: Map GP-128, U. S. Geological Survey.
7. Mossler, John, 1973, Isopach Map of Unconsolidated Materials, Roseau Sheet, Minnesota: Open File Map, Minnesota Geological Survey.
8. Sims, P. K. and Ojakangas, R. W., 1973, Precambrian Geology of Roseau Sheet, Minnesota: Open File Map, Minnesota Geological Survey.
9. Winter, T. C., Maclay, R. W. and Pike, G. M., 1967, Water Resources of the Roseau River Watershed, Northwestern Minnesota: Atlas HA-241, U. S. Geological Survey.

Base for maps on this sheet from U. S. Geological Survey, Roseau 1:250,000 topographic map.

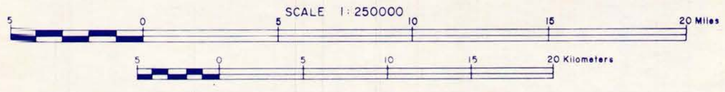
MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINERALS

MINERAL COMPILATION OF EASTERN ROSEAU COUNTY

By D. G. Meineke and W. H. Listerud

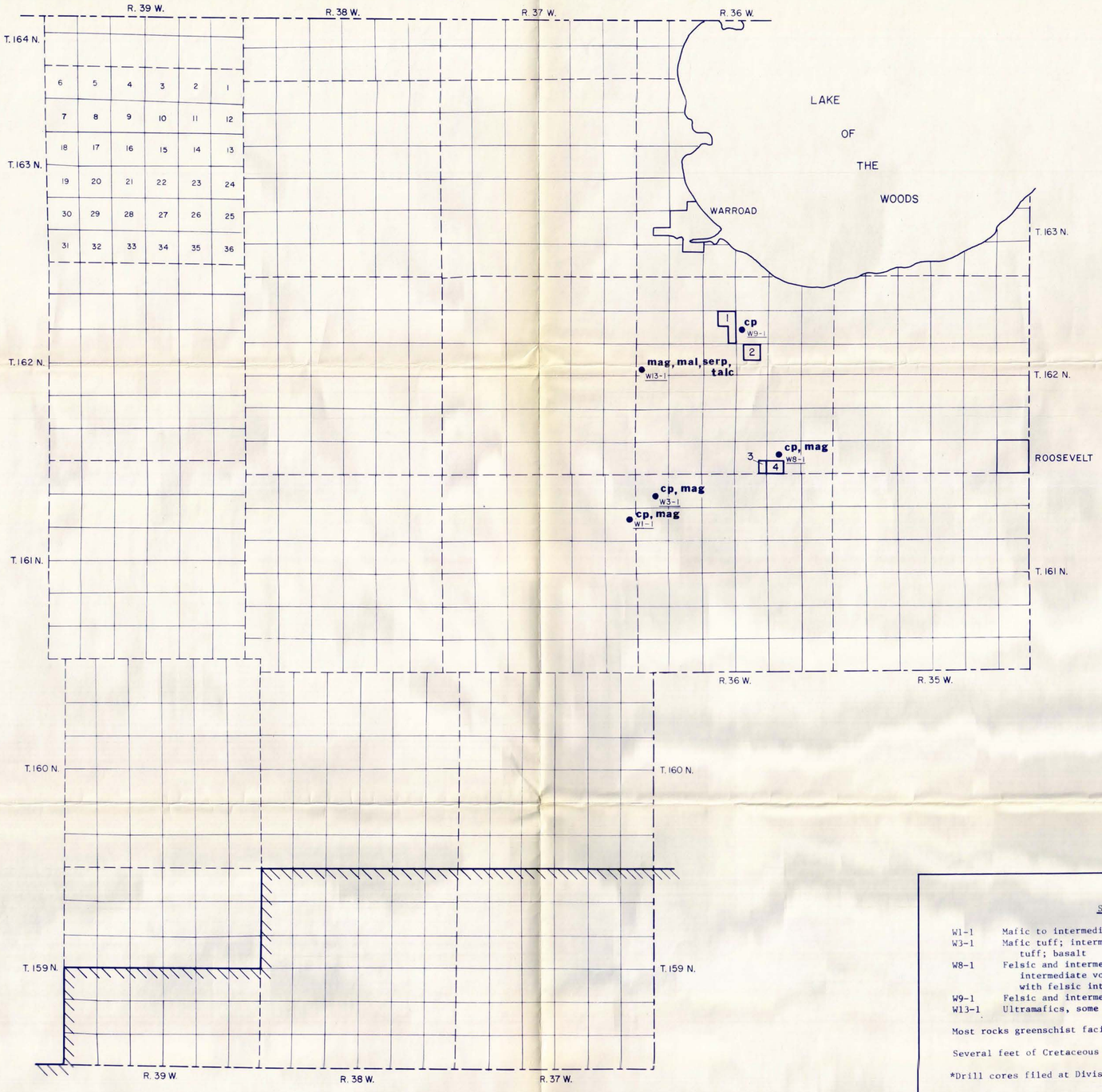
D. G. Meineke, Supervisor of Minerals Exploration



1978

MAP 143
SHEET 1 of 2

MANITOBA



MINERAL ABBREVIATIONS

cp - Chalcopyrite
mag - Magnetite
mal - Malachite
talc - Talc
serp - Serpentine

EXPLANATION

Boundary of area offered by the State of Minnesota for Cu-Ni leasing. No Cu-Ni leases have been issued within this boundary. Terminated Cu-Ni leases shown were negotiated outside this boundary by request.

2 — Terminated State of Minnesota Cu-Ni lease - number identifies lease in "data" table.

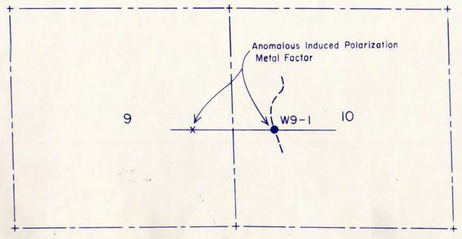
W3-1 — Vertical diamond drill hole.

Base for map on this sheet from Minnesota Department of Transportation 1:125,000 general highway map, and U. S. Geological Survey, Swift and Warroad SE 1:24,000 topographic maps.

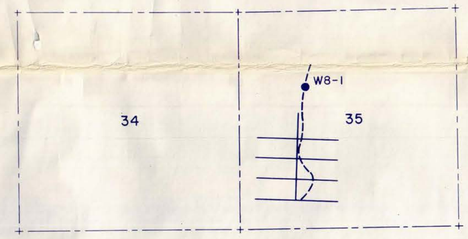
DATA FROM TERMINATED STATE Cu-Ni LEASES FILED AT THE DIVISION OF MINERALS, HIBBING, MINNESOTA					
MAP INDEX NUMBER	MINING COMPANY	GROUND MAGNETICS	INDUCED POLARIZATION	STATE LEASE NUMBER	YEAR LEASED
1	Humble Oil & Refining Co.		.71	CN-7836-N.	1971
2	Humble Oil & Refining Co.	No	Data.	CN-7836-N.	1971
3	Humble Oil & Refining Co.	No	Data.	CN-7837-N.	1971
4	Humble Oil & Refining Co.	71		CN-7837-N.	1971
Year indicates date survey was conducted.					

GROUND GEOPHYSICS

SECTIONS 9 & 10 - T. 162 N. - R. 36 W.



SECTIONS 34 & 35 - T. 162 N. - R. 36 W.



Geophysical grid

Trend of magnetic anomaly

SCALE 1:24,000
1 Mile
1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

SUMMARY OF DIAMOND DRILL HOLES*

W1-1 Mafic to intermediate volcaniclastics; basalt; felsic volcanics; diabase
W3-1 Mafic tuff; intermediate volcanics; mafic volcaniclastics; intermediate tuff; basalt
W8-1 Felsic and intermediate tuff; 15 feet of magnetite-rich rock; mafic tuff; intermediate volcaniclastics; fragmental felsic and intermediate tuff, with felsic intrusive
W9-1 Felsic and intermediate volcaniclastics; intermediate tuff
W13-1 Ultramafics, some serpentinized and fragmental

Most rocks greenschist facies or higher grade metamorphism.

Several feet of Cretaceous weathering occurs in the tops of most diamond drill holes.

*Drill cores filed at Division of Minerals - Drill Core Library, Hibbing, Minnesota.

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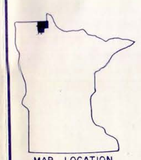

SCALE 1:125,000
2 0 2 4 6 8 10 Miles
2 0 2 4 6 8 10 Kilometers

1978

MAP 143
SHEET 2 of 2