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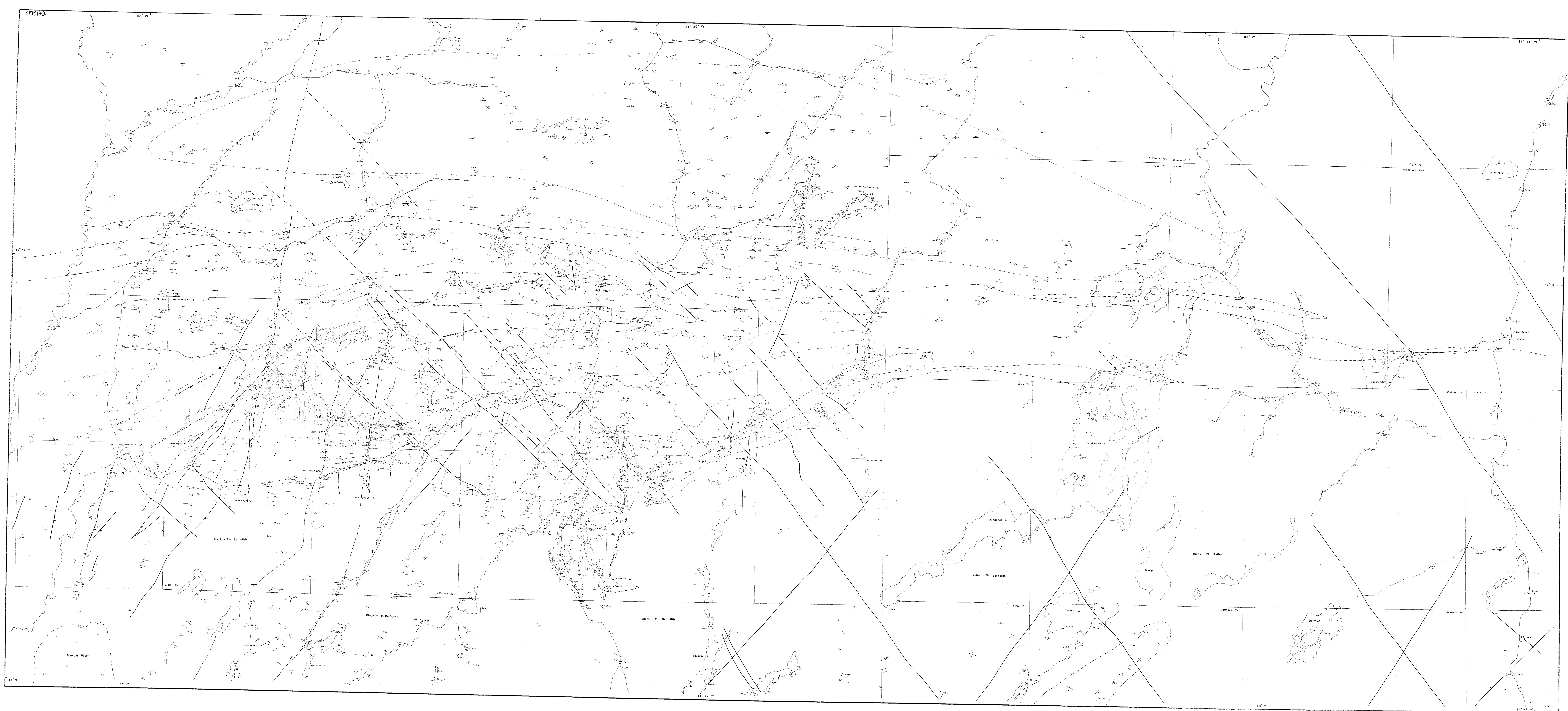
It is recommended that reference to the Content be made in the following form:

Williams, H.R. and Breaks, F.W. 1990. Geology of the Manitouwadge-Hornepayne area; Ontario Geological Survey, Open File Map 142, scale 1:50 000.

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MARGINAL NOTES

LOCATION AND ACCESS

The map area is bounded by latitudes 49°N to 49°30'N and longitudes 86°15'W to 84°45'W, and includes the area of Manitowadge and Herkimer. The map area contains two separate networks of access roads that provide from both Manitowadge and Herkimer. The exact position of the region is most accessible from the latter.

GENERAL EXPLORATION

General exploration, mainly for base metals, continues within the region in the vicinity of Manitowadge. Much exploration has been undertaken by the operations of the Geo-Mine, Toronto, Inc., and its predecessors, but other exploration (e.g., Ontario Department of Mines, Geological Division) is being planned for the near future.

GENERAL GEOLOGY

Previous regional mapping of the area was carried out at various scales by Cowi (1968, 1970), Gignere (1972), Milne (1964, 1968), Pye (1960) and Thompson (1972). Milne (1974) mapped in detail the vicinity of the Geo-Mine. Data from these published maps have been incorporated into this map.

Apart from Pleistocene to Recent fluvial-glacial and alluvial deposits on top land and Proterozoic diabase dyke swarms, all rocks in the region are considered to be Mesozoic. The reader is referred to Williams and Braks (1980, 1990) for a fuller account of the geology of the region.

Within the central portion of the map area a relatively continuous unit of foliated and metamorphic rocks, including igneous and sedimentary rocks, most developed in the Manitowadge area, marks the northern boundary of the West Suprocrust. The southern part of the map area consists of highly strained metasedimentary and igneous rocks, originally deposited in the vicinity of the Ontario Subappennine. These metasedimentary rocks are separated from the West Suprocrust by a zone of intense deformation, including a zone of intense folding and thrusting, to the south by foliated igneous and metamorphic rocks, including gneiss and schist, and deformed polydeformed igneous, intruded by an area, a domical mass of foliated igneous rocks, intruded by granitoids, the Black-Pic Batholith (Milne, 1968), and the supracrustal rocks to the south and east, associated with granitic rocks, including the Hertsberg-Hertsberg gneiss to the south.

STRUCTURE

The structure of the region is characterized by a complex pattern of faults and folds. The most prominent features are the Manitowadge and Black-Pic faults, which are major regional faults. The Manitowadge fault is a large-scale fault that trends north-south through the center of the map area. The Black-Pic fault is a major fault that trends east-west through the southern part of the map area. Other faults include the Manitowadge system, the Black-Pic system, and various smaller faults. The folds are generally small-scale and are associated with the intense deformation zone. The structure is characterized by a complex pattern of folding and thrusting, with a zone of intense deformation separating the West Suprocrust from the Ontario Subappennine.

METAMORPHISM

Most of the rocks in the region are generally within amphibolite facies grades of metamorphism. The amphibolite facies is characterized by the presence of hornblende and plagioclase. The amphibolite facies is developed in the West Suprocrust and the Ontario Subappennine. The amphibolite facies is also developed in the zone of intense deformation. The amphibolite facies is characterized by the presence of hornblende and plagioclase. The amphibolite facies is developed in the West Suprocrust and the Ontario Subappennine. The amphibolite facies is also developed in the zone of intense deformation.

ECONOMIC GEOLOGY

Base metal mineralization in the map area is concentrated around Manitowadge and consists of deformed massive sulfides, especially associated with the Manitowadge system. The sulfides are mainly composed of pyrite, galena, and sphalerite. The sulfides are associated with the Manitowadge system and are developed in the zone of intense deformation. The sulfides are characterized by the presence of pyrite, galena, and sphalerite. The sulfides are developed in the West Suprocrust and the Ontario Subappennine. The sulfides are also developed in the zone of intense deformation.

ABBREVIATIONS

- G: Granite
- Cu: Chalcopyrite
- M: Magnetite
- S: Pyrite, sphalerite
- Zn: Sphalerite

SYMBOLS

- Contact, inferred
- Diabase dyke
- Fault
- Strike and dip of mineral foliation, schistosity, lineation, and/or differential layering; vertical, inclined, horizontal
- Trend and plunge of lineation, schistosity, lineation, and/or differential layering
- Trend and plunge of minor fold
- Trace of system, unknown

REFERENCES

COWI, E.E. 1968. Geology of the Severn-Kaplan Lake area. Ontario Department of Mines, Geological Report 45, 22 p.

--- 1970. Geology of the Killala-Vin Lake area. Ontario Department of Mines, Geological Report 51, 22 p.

GIGNERE, J.F. 1972. Geology of the Grenville Lake area. Ontario Department of Mines, Geological Report 70, 22 p.

MILNE, V.J. 1964. Geology of the Flinders Lake area, Thunder Bay and Algoma Districts, Ontario. Department of Mines, Geological Map 2407, scale 1:40,000.

--- 1968. Geology of the Black River area, Ontario. Department of Mines, Geological Report 72, 22 p.

--- 1974. Map of the Manitowadge area. Ontario Department of Mines, Geological Map 2281, scale 1:125,000.

PYE, E.G. 1960. Geology of the Manitowadge area. Ontario Department of Mines, Annual Report, Volume LXVI, part 8, (1957), 1-114.

THOMPSON, J.E. 1972. Geology of the Herkimer area, Ontario. Ontario Department of Mines, Annual Report, Volume LXVI, part 2, 1-114.

WILLIAMS, H.R., and BRACK, F.W. 1980. Geology of the Manitowadge area. Ontario Department of Mines, Annual Report, Volume LXVI, part 8, (1957), 1-114.