

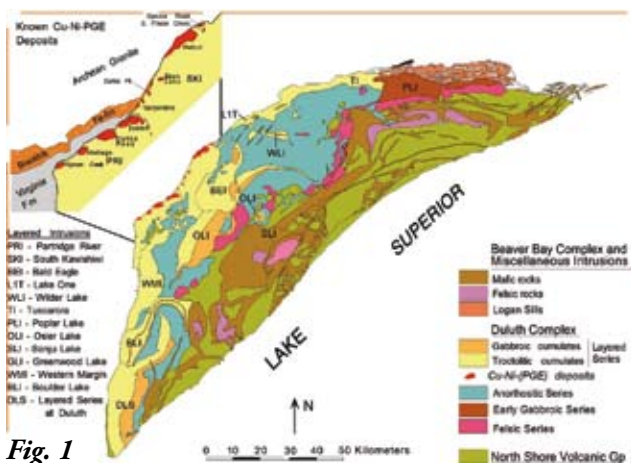
Explore Minnesota: COPPER, NICKEL, PGEs

Geology

Minnesota's known copper-nickel-PGE deposits that have received the most attention, including the several deposits now being considered for possible near-term development, are located within the 1.1 billion-year-old Duluth Complex, one of the great basic igneous complexes of the world.

The Duluth Complex is the major intrusive component of the Midcontinent Rift, a failed, horseshoe-shaped intracontinental rift system that is exposed in the Lake Superior Region.

The Duluth Complex is not a single layered igneous intrusion like the Bushveld of South Africa. Rather, it is a composite mass of smaller intrusions all closely related in space and time that were emplaced into the basal section of comagmatic volcanic rocks of the rift. The currently known deposits occur in two crudely layered intrusions, the South Kawishiwi and the Partridge River. With the exception of the Filson Creek deposit, about eight major deposit areas occur in these intrusions within 500 meters of their basal contact with Paleoproterozoic sedimentary rocks and Archean granites. (Fig.1). The Filson Creek deposit appears to be a later stage mineralizing event and is generally above the basal zone.



The known deposits have been estimated to contain 4 billion tons of copper-nickel ores with co-product PGE, Au, and Co.

Other Potential Targets

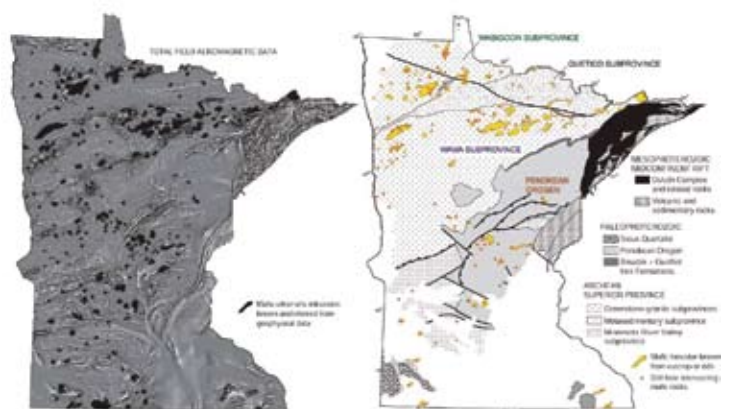
In addition to some targets within the Partridge River and the South Kawishiwi intrusions, there are many unexplored targets in the other 10 or more intrusions that compose the Duluth Complex (Fig.1). Several of these are better layered and might host Skaergaard-type PGE reef mineralization, while others may host basal contact-type mineralization.

There may also be as yet undiscovered outlying intrusions related to the Midcontinent Rift like the one hosting the recently discovered Eagle massive copper-nickel-PGE deposit in northern Michigan.

The potential for Cu-Ni-PGE deposits in basic intrusions outside of the rift system is not well known. The Minnesota Geological Survey is just completing a four-year study of outcrop, drill core, and geophysical data to inventory the occurrences of mafic and ultramafic intrusions outside the Duluth Complex (Fig. 2). Using geochemical and lithologic data, these intrusions will be evaluated as to their mineralization potential.

History of Exploration

Though occurrences of copper had been noted in earlier years, serious exploration of Minnesota's copper-nickel resources did not begin until about 1950 following the discovery of mineralization during the blasting of a road cut in the Duluth Complex rocks along the Spruce Road. During the ensuing 25 years, considerable exploration was carried out by a number of major mining companies along the basal contact of the Complex. Over 2,000 core holes were drilled by various explorers, generally close to the basal contact. Most of the deposits known today were identified at that time and considerable work was done to try to develop them.



In 1974, the state instituted a moratorium on further leasing and a generic environmental impact statement on copper-nickel mining and processing. This moratorium lasted until 1980. After removal of the moratorium, some renewed

Active Cu-Ni-PGE Projects

PolyMet Mining

PolyMet, a TSX listed company, completed their feasibility study and is working towards obtaining permits to develop the NorthMet deposit as a 32,000 tpd open pit with approximately a 1.1:1 life-of-mine stripping ratio. The NorthMet

resource is approximately 900 million tons grading 0.32% Cu, 0.085 % Ni, 0.006 % Co, and 0.43 grams per tonne platinum group metals. The company has taken ownership of most of the former LTV taconite processing plant, including tailings ponds. Production is planned for mid-2009.

Franconia Minerals Corporation

Franconia, a TSX-V listed corporation, plans to develop the Birch Lake deposit. This deposit will be an underground mine with a production rate on the order of 1.5 million metric tonnes per year. The orebody will be developed from vertical shafts and is expected to be mined by mechanized room-and-pillar heading-and bench methods. The currently estimated 43-101 compliant inferred resource is 100.4 million MTs at a crude ore grade of 0.59% Cu, 0.19% Ni, 0.01% Co, 0.14 g/t Au, 0.65 g/t Pd, and 0.32 g/t Pt calculated at an NSR cutoff grade of \$25 per metric tonne at long-term metal prices of \$1.50 Cu, \$6 Ni, \$10 Co, \$450 Au, \$300 Pd, and \$800 Pt.

Franconia has also announced its intention of conducting a 43-101 compliant resource estimate of its recently acquired Maturi deposit, which had been extensively drilled and explored by a shaft and limited underground workings before 1974 by INCO. This will also be an underground mine. Joint processing of Birch Lake and Maturi ores is being considered.

Also planned by Franconia is exploration of a highly prospective massive copper-nickel exploration target identified from four drill holes drilled in the 1960s and '70s. This prospect lies about 3 km southwest of Birch Lake.

Teck-Cominco

Teck-Cominco holds leases on the largest known deposit in the belt, the Mesaba (or Babbitt) deposit which lies between the NorthMet and Birch Lake deposits. The CESL hydrometallurgical process was developed to treat these ores, but the company's future plans have not yet been announced.

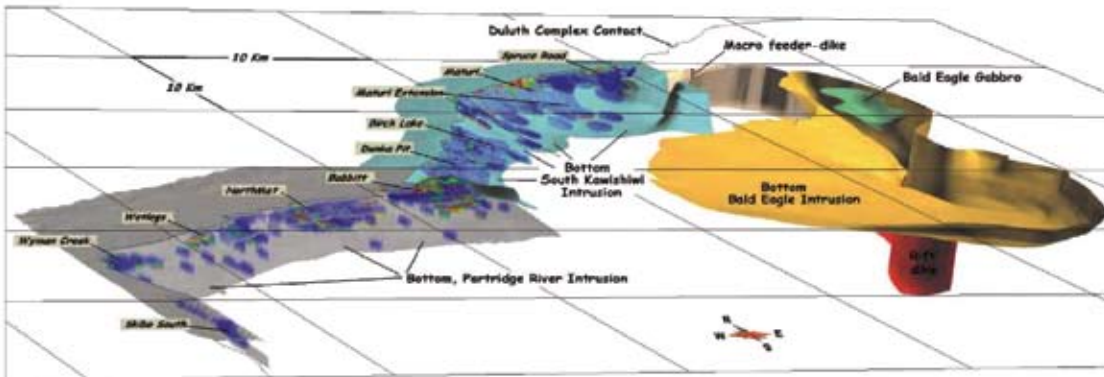


Fig. 3 Active Cu-Ni-PGE projects.

work was carried on, mainly by AMAX. However, declining copper prices and the failure by conventional flotation processes, to be able to produce a suitably high-grade bulk concentrate or satisfactorily clean separate copper and nickel concentrates prevented the production of an economically acceptable product for conventional smelting. During all of this period, the generally low-grade PGE values were ignored.

Discovering Significant PGEs

In 1985, the Minerals Division (now Lands and Minerals Division) of the state's Department of Natural Resources undertook a program of assaying old drill cores for vanadium, chromium, and PGEs. In the course of this sampling, a seven-foot zone of significant PGEs was discovered in one hole drilled by Duval in the 1970s. This announcement and rising interest in PGEs for catalytic converters triggered a short period of PGE exploration; but since the PGEs were associated with copper and nickel, the metallurgical puzzle remained. PGEs now added possible value not previously recognized to the deposits.

Solving the Metallurgical Puzzle

In the mid-1990s, solutions for the metallurgical puzzle began to appear on the horizon as hydrometallurgical processes advanced. Work by Teck-Cominco has resulted in the development of CESL, a proprietary pressure oxidation leach plus SXEW process that can extract the Cu, Ni, and Co from a bulk floatation concentrate. It was tested on the Mesaba (Babbitt) deposit ores and has been recently pilot plant tested in Brazil. A second proprietary process, PlatSol, which extracts both the base and precious metals, has been developed in conjunction with PolyMet's exploration and development of the NorthMet (Dunka Road) deposit. It has been pilot plant tested on two occasions.

With the key metallurgical puzzle now apparently solved, the door is open to economic development.

The deposit is reported to contain about 800 million tonnes open pit ore with 0.43% Cu and 0.11% Ni plus a small amount of Au and PGEs, and also about 400 million tonnes of underground ore with a grade of 0.82% Cu and 0.19% Ni.

Duluth Metals

Duluth Metals is a new company focused on exploring and developing its Maturi-Extension copper-nickel-PGE property in northeastern Minnesota. Duluth Metals has indicated that it plans a 10,000+ meter drilling program to evaluate its property.

Infrastructure

Minnesota is a mining state. It hosts about 75 percent of the U.S. domestic iron ore production and iron has been mined here for well over 120 years. Its iron (taconite) mines annually move on the order of 240 million tons of material per year to produce about 40 million tons of high-grade iron pellets. As a result, there is skilled mining labor and the needed suppliers of mining goods and services. Minnesota has deep-water ports on Lake Superior, providing access to world markets. Power lines, railways, and highways reach most areas. A high standard of education is accessible to employees.

Land and Mineral Ownership

Because of the history of the state's development, land ownership is complicated—ownership of minerals and surface may be in different parties and ownership patterns vary in different parts of the state. Acquisition is generally done by leasing.

The state is the largest owner of mineral rights, holding about 20 percent or 12 million acres. It has in place a system of leasing of state minerals for exploration and mining. The federal government also holds a large acreage of surface and minerals, mainly in the northeast and north central area. Only a part of the federally-owned mineral rights is available for entry under the U.S. Mineral Lease Laws. The balance is in private holding of various sizes and may involve “split” estates.

Taxation

The state of Minnesota levies two taxes specific to non-ferrous mineral production: an “Occupation Tax” which is essentially the same as the corporate income tax and has an effective rate of 2.45 % of taxable income after depreciation and depletion. The second tax is a 2% “Net Proceeds Tax” which is levied on income before interest, depreciation, depletion, and royalties. It is in lieu of an ad valorem tax on ore reserves. Most mining equipment is exempt from the sales tax. The county and municipality levy an ad valorem

tax on building, but there is no personal property tax on mining or processing equipment.

Regulation and Permitting

The two principal regulatory and permitting authorities are the state's Department of Natural Resources and the Pollution Control Agency. Exploration drilling requires only notice to the Department of Natural Resources and the state Health Department.

Rules for permitting non-ferrous mining operations have been in place for over 15 years. For commercial operations, the rules require a mandatory Environmental Impact Statement before the approval of any permits. The major issues will generally relate to water, sulfide-bearing mine wastes, and, in some cases, air emissions. A high level of environmental standards is desired by the state, and the history of the mining industry in Minnesota demonstrates that conditions can be satisfactorily met.

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