**Geoscience Canada**

# Geological Atlas of the Western Canada Sedimentary Basin

Grant D. Mossop

Volume 15, numéro 2, june 1988

URI : https://id.erudit.org/iderudit/geocan15_2abs03

Aller au sommaire du numéro

Éditeur(s)

The Geological Association of Canada

ISSN

0315-0941 (imprimé)
1911-4850 (numérique)

Découvrir la revue

Citer cet article

Mossop, G. D. (1988). Geological Atlas of the Western Canada Sedimentary Basin. *Geoscience Canada*, *15*(2), 120–120.

# Abstracts

## The Namew Lake Nickel-Copper Discovery, Flin Flon, Manitoba

James R. Pickell
*Hudson Bay Mining and Smelting Co. Ltd.*
*Flin Flon, Manitoba R8A 1N9*

The Namew Lake nickel-copper deposit occurs approximately 60 km south of Flin Flon in the gneissic southern extension of the Aphebian Flin Flon greenstone belt. Conductive metasedimentary horizons within the gneissic terrane, which were detected by airborne electromagnetic surveys, appear to define open fold structures beneath a thin Phanerozoic cover that buries the southern part of the belt. The integration of sparse geophysical and geological information in an area covered by Ordovician carbonates and conductive Pleistocene clays is essential for drill target selection purposes.

A 0.3-4 m thick layer of near solid sulphides (violaritized pentlandite, chalcopyrite and pyrite) forms a conductive halo around the top 110 m of the Namew pipelike ultramafic (UM) sill. This high-grade layer resulted from remobilization into a tectonic breccia immediately above the upper termination of the UM sill. Supergene enrichment just below the Pre-cambrian-Paleozoic contact further upgraded the breccia ore. This sulphide-cemented, aplite breccia-hosted ore passes into a lower grade, nonconductive, 3-30 m thick, interstitial sulphide ore within a lenticular pyroxenite-peridotite sill. The low-grade ore contains up to 15%, 3-10 mm blebs of pentlandite, chalcopyrite, pyrrhotite and/or pyrite. The Namew UM body, striking N 10°W, dipping 48°SW and plunging 20°NW, is concordant with the gneissic quartz diorite to granite country rocks. The late, mantle-derived UM sill, which has komatiitic affinities and schistose, slightly hydrated, talcose margins, may have been injected into the core of a major anticline.

Diluted recoverable reserves between the 61 m and 335 m levels are currently estimated at 2.58 million tonnes assaying 2.44% nickel and 0.9% copper, with significant amounts of platinum and palladium.

## Can the Pine Point Zn-Pb Deposit be derived from formation waters in Middle Devonian rocks of Northern Alberta with Pb > Zn?

Brian Hitchon
*Basin Analysis Group*
*Alberta Geological Survey*
*Alberta Research Council*
*P.O. Box 8330, Station F*
*Edmonton, Alberta T6H 5X2*

Trace metals have been determined in a suite of formation waters recovered from drillstem tests in Middle Devonian and Granite Wash rocks of northern Alberta. Contents of Pb up to 350 $mg \cdot L^{-1}$ and Zn up to 90 $mg \cdot L^{-1}$ have been found, with total Pb > total Zn in about 60% of the samples. Using the program SOLMNEQF it is found that the dominant form of Pb and Zn in the formation waters under reservoir conditions is as chloride complexes, with the balance of these metals occurring in ionic form. Cooling of these brines results in little change in the proportions of chloride complexes and ionic form of these metals. Cooling and dilution, however, result in both an increase in the proportion of metals held in ionic form (that is, a breakdown of the chloride complexes) and in a change in the ratio of the ionic form to mainly $Zn^{2+} > Pb^{2+}$. A simplistic model is developed to derive the Pine Point Zn-Pb deposit from existing formation waters with Pb > Zn; whether this model is correct remains enigmatic.

## Geological Atlas of the Western Canada Sedimentary Basin

Grant D. Mossop
*Alberta Geological Survey*
*Alberta Research Council*
*P.O. Box 8330, Station F*
*Edmonton, Alberta T6H 5X2*

A multi-disciplinary, multi-institutional project to produce a new atlas of the subsurface geology of the Western Canada Sedimentary Basin is now underway. Phase I, technical and strategic planning and design, was completed in December 1986. The Phase II compilation, initiated in January 1987, will culminate in production of the printed atlas in March 1991. Phase III, as yet unconfirmed, will involve ongoing maintenance and update of the electronic data files, and consequent realization of a "living atlas" concept.

The prospectus for the compilation and production work appears to be technically, strategically and financially sound. Core funding is in place ($1.5 million, to 1991). Digital data files on subsurface stratigraphy and lithology have been contributed or committed from each of the provincial jurisdictions in western Canada and from the private sector. A total of 49 geologists from industry, government and academia have volunteered as contributors, representing on the order of 18 person-years of committed effort. The number of contributors continues to grow.

For each of the 15 to 20 selected stratigraphic intervals, the published atlas is envisaged as having the following (provisional) specifications — structure, isopach, lithofacies, paleogeologic and paleogeographic maps (1:5,000,000, compiled at 1:2,000,000); regional, log-based cross-sections; type logs; correlation charts. There will also be integrated or separate-chapter treatment of tectonics and basin architecture, thermal/organic maturity indices, hydrodynamic regimes, and economic geology (petroleum, coal, minerals). Where and if appropriate, there will also be treatment of selected geotechnical parameters (*e.g.*, subsurface stress fields) and geophysical parameters (*e.g.*, seismic profiles).