

Chapter 1

Base and precious metals

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Northern Superior Province

Serge Perreault

The Ungava region (Nunavik) covers a vast surface area of about 350,000 km². Although relatively under explored, this region offers a very promising mineral potential.

Since 1998, **Géologie Québec** has completed 22 geological surveys within the scope of the Far North Project. In 2004, **Géologie Québec** continued its geological synthesis of the Far North (Leclair *et al.*, 2004) and published a synthesis map of mineral occurrences for the northeastern Superior Province (Labbé and Lacoste, 2004). **Géologie Québec** was also involved in two studies: 1) phase 3 of a geochemistry and Nd isotope study of volcanic and plutonic assemblages in the Far North (Boily *et al.*, 2004) and 2) a study of polyphase glacial dispersal patterns and diamond exploration in the eastern Saindon-Cambrien corridor with the **Geological Survey of Canada** (Parent *et al.*, 2004). The **Geological Survey of Canada** also produced a map of ice flow indicators for the Lac Maricourt (24 D) and Lac Gayot (23 M) areas (Paradis and Parent, 2004).

In 2004, a total of 15 exploration projects were carried out in the northern Superior Province (Table 1A-1). The bulk of exploration expenditures were spent in the search for diamond or gold. One project was funded under the Québec Mineral Exploration Assistance Program (MEAP), to support the **Nunavik Mineral Exploration Fund**.

The following sections describe the most significant exploration projects carried out in 2004 in the eastern part of the Opatoca Subprovince and in the Minto Subprovince, as well as diamond exploration projects.

Opatoca Subprovince

The Opatoca Subprovince comprises Archean metavolcano-sedimentary sequences and plutonic suites located between the Abitibi Subprovince to the south and the Opinaca and Ashuanipi subprovinces to the north (Hocq, 1994; Lamothe *et al.*, 1998). The eastern part of the Opatoca Subprovince is formed of the Brûlis Group, a basaltic to intermediate volcanic assemblage metamorphosed to the upper amphibolite facies, as well as hornblende-biotite granodiorite, hornblende monzogranite, and leucocratic biotite and locally hornblende-bearing tonalite (Lamothe *et al.*, 1988).

In the Lac Courcy area, **Géologie Québec** had previously reported the presence of gold showings (Courcy 1 and Courcy 2; Thériault *et al.*, 1998) associated with iron formations and mafic and felsic volcanic rocks of the Soucy and Soulard formations in the Brûlis Group. After signing an agreement with

prospector **Jean Fortin** in 2003, **SOQUEM INC.** (project 15, Figure 1A-1) uncovered, during the summer 2004, a series of gold occurrences associated with volcanogenic massive sulphide mineralization. The best results from trench samples were obtained on the following showings: DL-02, with grades of 91 g/t Au and 7.3 g/t Ag; Courcy 2, with 3.3 g/t Au; Souche, with grades of 4.8 g/t Au, 6 g/t Ag, and 0.25% Zn; and SL-12, with 2.53 g/t Au. A channel sample from showing SL-29 yielded assays of 10.75 g/t Au over 1 m.

Diamond

Moorhead *et al.* (2000) stressed the importance of major brittle structural zones, locally defined by late faults, aeromagnetic lineaments, remote-sensing lineaments, and graben-type sedimentary basins, as controlling factors for the emplacement of alkaline and kimberlitic magmatism. Several major crustal lineaments transect the Bienville, Minto, and Ashuanipi subprovinces (Labbé, 2000; Labbé and Lamothe, 2001), including the Saindon-Cambrien corridor, the Allemand-Tasiat structural zone, and the Richmond Gulf structural zone (Moorhead *et al.*, 2000).

In 2004, diamond exploration activities consisted of reconnaissance work carried out by joint venture partners **Ashton Mining of Canada Inc.** and **SOQUEM INC.**, as well as a drilling program which yielded inconclusive results, performed by **Majescor Resources Inc.** and **Diamondex Resources Ltd** in the Lac Gayot area.

Opportunities for Exploration

In the current economic context, with gold prices reaching historical highs and mineral exploration financing as promising as ever, it is worth mentioning that several greenstone belts in the Minto Subprovince host interesting gold occurrences, namely associated with iron formations in the Far North. For example, on the Kogaluk property, **Virginia Gold Mines Inc.** and **SOQUEM INC.** reported grades up to 60 g/t Au in grab sample, 2.85 g/t Au over 4.1 m in channel sample, and 2.20 g/t Au over 27.9 m in drillhole, including high-grade zones at 9.89 g/t Au over 2.1 m and 14.25 g/t Au over 1.5 m.

In the eastern Ashuanipi Subprovince, west of Schefferville, and in the eastern Opatoca Subprovince, metasedimentary bands represent interesting targets for gold exploration. Recent work by **SOQUEM INC.** in the Lac Courcy area is very promising, and opens up this area to more advanced exploration.

With the sharp rise in uranium prices, uranium exploration is thriving again, nearing levels recorded in the mid-1980s. As remnants of a former Paleoproterozoic sedimentary basin overlying the Archean basement of the Minto Subprovince,

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the various outliers of the Sakami Formation are certainly interesting in this regard. These outliers are aligned along the Saindon-Cambrien structural corridor, already a target area for diamond exploration. Note that in 1980, mining company **Uranerz** estimated mineral resources at the Dieter Lake deposit, also referred to as the Lac Gayot deposit (deposit file 23 M/15-001),

at 50 million metric tonnes at 0.1% U_3O_8 or between 10 and 15 Mt at 0.25% U_3O_8 . This uranium deposit is a syngenetic mineralization that underwent an intermediate enrichment process (Gosselin and Simard, 2000). Recently, **Strathmore Minerals Corp.** acquired the mining rights on the Dieter Lake deposit.

Proterozoic

- Volcano-sedimentary sequences of Paleoproterozoic basins

Archean

- Volcano-sedimentary greenstone belts.
- Opinaca:** Volcano-sedimentary sequences and plutonic rocks.
- La Grande:** Volcano-sedimentary sequences and plutonic rocks.
- Ashuanipi:** Charnockitic and granitic plutonic complexes with metamorphosed volcano-sedimentary belts at the granulite facies.
- Bienville:** Tonalitic and granitic plutonic complexes, with enderbite and charnockite; locally with volcano-sedimentary belts
- Lepelle:** Granitic and charnockitic plutonic complexes.
- Utsalik:** Granitic and charnockitic plutonic complexes with rare volcano-sedimentary belts.
- Douglas Harbour:** Granitic and charnockitic plutonic complexes with volcano-sedimentary belts.
- Goudalie:** Tonalitic and charnockitic plutonic complexes, diatexites, volcano-sedimentary belts.
- Qualluviartuuq:** Volcano-sedimentary belts, tonalitic and granodiorite plutonic complexes.
- Lac Minto:** Volcano-sedimentary belts, tonalitic and charnockitic plutonic complexes, diatexites, granodiorite.
- Tikkerutuk:** Sedimentary belts, tonalitic and charnockitic plutonic complexes, diatexites, granodiorite.
- Inukjuaq:** Volcano-sedimentary belts of 3.8 to 3.0 Ga, tonalitic and charnockitic plutonic complexes.

Mineralization types

- Au in iron formations
- Volcanogenic Cu-Zn-Au-Ag
- Au in shear zones
- Porphyric (?) type Cu-Au-Ag-Mo
- Ni-Cu-PGE's in komatiites
- Cu in veins
- Rare Earths
- Uranium
- Ni-Cu-PGE's in mafic and ultramafic intrusions
- Iron
- Pb-Zn

- Mine

Figure 1A-1. Legend of exploration projects in the northern Superior Province for 2004.

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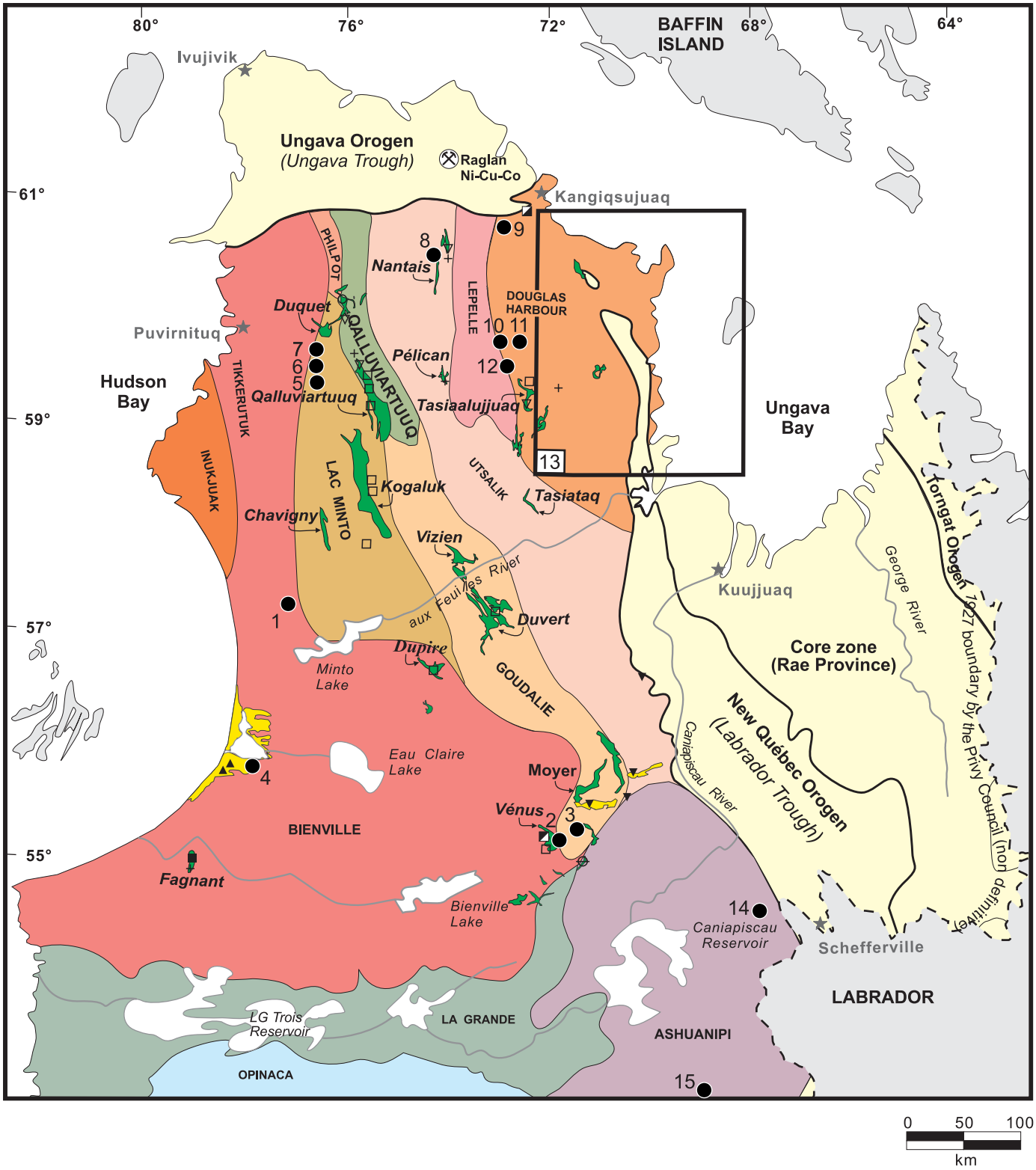


Figure 1A-1. Exploration projects in the northern Superior Province for 2004.

TABLE 1A-1 - Exploration projects in the northern Superior Province for 2004 (see figure 1A-1).

NO	NTS	COMPANIES / PROSPECTORS	PROJECTS	SUBSTANCES	WORKS ⁽¹⁾
1 ⁽²⁾	-	Ashton Mining Canada Inc. / SOQUEM INC.	Regional reconnaissance	Diamond	S
2	23 M/11	Virginia Gold Mines Inc. / BHP Billiton Diamond Inc.	Gayot	Ni-Cu-Co-PGE	D(14:2742), EM
3	23 M/06, 07, 10, 11, 15, 16	Majescor Resources Inc. / Diamond Resources Ltd	Gayot	Diamond	D(5:213), Mag, Mag(A)
4	34 C/01, 02	Nunavik Mining Exploration Fund / SOQUEM INC.	Umiujaq	Cu-Ag	EM
5	34 O/05	Canadian Royalties Inc.	Alorutchaak	Ni-Cu-Co	Rsi
6	34 O/12	Canadian Royalties Inc.	Kogaluk	Ni-Cu-Co	Rsi
7	34 O/13	Canadian Royalties Inc.	Ferguson	Ni-Cu-Co	Rsi
8	35 A/13	Ressources Antoro Inc.	Nantais	Zn-Pb-Cu-Ag-Au	G
9	35 H/02	Ressources Antoro Inc.	Lataille	Rare earth	G, S
10	35 A/01	Ressources Antoro Inc.	Frank and Glass	Au-Ni-Cu-PGE	G
11	35 A/01	Ressources Antoro Inc.	Hamelin	Au	S
12	34 P/16	Ressources Antoro Inc.	Douglas Harbour	Cu-Ni-PGE	G, Pg
13	24 M, N, 25 C, D, E, F	SOQUEM INC.	-	Ni-Cu-Co-PGE-Au-Ag	G, Pg
14	23 J/13, 14	E. D. Black / New Stafford Industries Ltd / Grandcru Resources Corp.	Ashuanipi Gold	Au	Mag, Mag(A), Rsi, Pg
15	23 C/10	SOQUEM INC.	Courcy	Au-Ag	Pr

1 = See the legend of abbreviations in appendix II.

2 = Regional reconnaissance project.