



Occurrence Details

Occurrence Number: 115G 033

Occurrence Name: Sexsmith

Occurrence Type: Hard-rock

Status: Prospect

Date printed: 12/15/2025 1:05:44 PM

General Information

Secondary Commodities: copper, gold, platinum

Aliases: Don

Deposit Type(s): Ultramafic Mafic Gabbroid Cu-Ni-PGE

Location(s): 61°31'25" N - -139°49'24" W

NTS Mapsheet(s): 115G12

Location Comments: .5 Kilometres

Hand Samples Available: No

Last Reviewed:

Capsule

Work History

Staked as Jay cl 1-32 and 37-172 (66138) in Jun/53 by Canalask Nickel Mines Ltd, a new company formed by Ontario Nickel Mines Ltd and Frobisher Ltd following an aeromagnetic survey conducted by Lundberg Exploration Ltd. Ground magnetic and self-potential surveys were completed to assist in ground acquisition and to outline areas for detailed study and exploratory drilling. Restaked as Wol cl 1-6 (Y77254) in Sep/73 by the Nickel Syndicate (Canadian Superior Exploration Ltd, Aquitaine, Home Oil Ltd and Getty Minerals Ltd). The area south of Wolverine Creek was staked as SF cl 1-84 (YA97576) and Missy cl 1-28 (YA97660) in Jun/87 by Harjay Exploration Ltd and Kluane Joint Venture (All-North Resources Ltd & Chevron Minerals Ltd). The Missy claims were in turn optioned to Lodestar Explorations Inc. Harjay and Lodestar carried out magnetometer and VLF-EM surveys on their respective claim groups in Jun/88. In July/94 Expatriate Resources Ltd staked Don cl 1-20 (YB46996) on the south side of Wolverine Creek. The company also staked Wolv cl 1-24 (YB47972) 4 km to the northwest (Minfile Occurrence #115G 088) at the same time. A combined electromagnetic /resistivity /magnetic survey was flown over both claim blocks in Aug/96. Expatriate expanded both claim blocks in Feb/2000, staking Wolv cl 25-38 (YC18509) and Don cl 21-34 (YC18523) contiguously with the existing claims blocks. In 2001, Expatriate carried out geological mapping, prospecting and soil and stream sediment sampling on both claim blocks on behalf of the Donjek Joint Venture (Expatriate Resources Ltd and Strategic Metals Ltd). In Oct/2002 Expatriate optioned the remaining Don claims, the neighboring Wolv claims and the Klux claims (Minfile Occurrence #115F 041) to Midnight Mines Ltd in return for a 1.0% net smelter return royalty and certain work commitments. In May/2003 ownership of the remaining Don, Wolv and Klux claims was transferred to StrataGold Corporation as part of a reorganization of Expatriate Resources although Midnight Mines retained their option. In Oct/2004 Midnight Mines contracted Aurora Geosciences Ltd to reinterpret total magnetic field data collected by the Geological Survey of Canada between Nov/65 and Apr/66.

Capsule Geology

The area is centered over Wolverine Creek approximately 8 km west of the Donjek River. The area was mapped in the 1960's by Muller (1967) of the Geological Survey of Canada. S. Israel of the Yukon Geological Survey published a geological compilation of southwest Yukon in 2004 and began re-mapping the region in the same year. In 2004 Israel and Van Zeyl, published a 1:50 000 map of the Quill Creek area which covers the area immediately to the southeast. In addition Greene et al., (2005) began a study of flood basalts which erupted onto the Wrangellia terrane. Comparison between these geological investigations and field work completed by Canalask Nickel Mines, Harjay Exploration, Lodestar Explorations and Expatriate Resources allows one to draw the following conclusions.

The area is covered by extensive overburden which limits the usefulness of geological mapping. Based on their geophysical work Canalask Mines mapped diorite, volcanic and sedimentary rocks south of Wolverine Creek. Harjay Exploration reported that old drill core on the north side of Wolverine Creek contained black siltstone containing disseminated chalcopyrite, and fine to medium grained diorite. Further south on the Missy claims Lodestar Explorations noted interbedded limestone, siltstones and conglomerates intruded by dioritic dyke and gabbroic lenses. Limited geological mapping carried out by Expatriate noted the presence of mafic and ultramafic rocks on the Don claims including intrusive peridotite, gabbro and diorite and extrusive andesite flows.

Comparing these descriptions with Israel's mapping, it appears the occurrence is underlain by a sequence of sedimentary rocks assigned to the Pennsylvanian (?) and Permian in age, Upper Hansen Creek formation. These rocks are overlaid by volcanic rocks assigned to the Upper Triassic Nikolai formation and possibly McCarthy formation limestone. The sequence is in turn intruded by ultramafic rocks assigned to the Triassic age Kluane mafic-ultramafic complex and gabbroic rocks assigned to the Cretaceous age Kluane Ranges suite.

The occurrence covers a very strong regional aeromagnetic anomaly (approximately 5 km long), located in an area of deep overburden. The nearest outcrops are found on the north side of Wolverine Creek and consist of diorite, volcanic and sedimentary rock. The anomaly lies on trend with the nickel and copper-bearing ultramafic rocks of the Quill Creek Complex (part of the Kluane Mafic-Ultramafic Belt) exposed to the southeast in the Arch and Quill Creek valleys. Ground geophysics on the SF claims identified a northwest-trending VLF-EM anomaly coincident with the west edge of a strong magnetic high and appears to outline a contact between highly magnetic rocks and weakly magnetic units.

Detailed airborne geophysics completed in 1996 identified a well defined resistivity low associated with a strong magnetic high and several moderately weak or broad conductors on the Don claims.

Geological mapping and sampling in 2001 identified pyritic mafic and ultramafic rocks, including peridotite, gabbro, diorite and andesite flows, underlying the claims. Five rock samples collected on the claims returned values of up to 424 ppm copper; 4 ppb platinum, 247 ppm chromium, 8.33% magnesium, 681 ppm nickel and 18 ppb gold.

Aurora Geosciences used an inversion algorithm and modeling software to re-analyze geophysical data previously collected by the Geological Survey of Canada. The results identified a large magnetic source on the claims which suggest the source is likely ultramafic rocks with the more susceptible areas possibly representing peridotite and pyroxenite units located in the eastern portion of the block. The block appears to be folded across a north-south and an east-west axis. The culmination occurs in the center of the study area.

References

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LODESTAR EXPLORATIONS INC, Oct/88. Assessment report #092575 by G.S. Davidson.

LODESTAR EXPLORATIONS INC, Sep/89. Assessment report #092744 by G.S. Davidson

MIDNIGHT MINES LTD, Oct/2004. Assessment Report # 094466 by M. Power.

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YUKON EXPLORATION 1989, p. 107.

Work History

Date	Work Type	Comment
2/1/2022	Airborne Geophysics	
2/1/2022	Airborne Geophysics	VLF-EM
2/1/2022	Airborne Geophysics	
2/1/2016	Geochemistry	
2/1/2011	Geochemistry	
2/1/2011	Geology	
12/31/2004	Pre-existing Data	Reinterpreted total magnetic field data collected by Geological Survey of Canada 1965-66.
12/31/2001	Geology	
12/31/2001	Geochemistry	Also silt sampling.
12/31/2001	Other	
12/31/1996	Airborne Geophysics	Also resistivity and magnetic surveys.
12/31/1988	Ground Geophysics	Also VLF- EM survey.
12/31/1953	Drilling	Drill core in place on north side of Wolverine Creek.
12/31/1953	Airborne Geophysics	
12/13/1953	Ground Geophysics	Also magnetic survey.

Assessment Reports that overlap occurrence

Report Number	Year	Title	Worktypes	Holes Drilled	Meters Drilled
096917	2016	Assessment Report on the 2016 Donjek Geological and Geochemical Program	Soil - Geochemistry		
096338	2012	Geological and Geochemical Assessment Report on the Donjek Project	Rock - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Prospecting - Other		
096045	2011	Geological and Geochemical Assessment Report on the Donjek Project	Rock - Geochemistry, Bedrock Mapping - Geology, Prospecting - Other		
094466	2004	Inversion of Aeromagnetic Data in the Area of the Wolv & Don Properties, Donjek River Area, Yukon Territory	Magnetic - Airborne Geophysics, Process/Interpret - Pre-existing Data		
093662	1996	Airborne Geophysical Survey on the Donjek Project Areas	Electromagnetic - Airborne Geophysics, Magnetic - Airborne Geophysics		
092054	1953	Report on the Geophysical Surveys in the Shakwak Valley Area, Yukon Territory for Canalask Nickel Mines Limited.	Magnetic - Airborne Geophysics		