## Occurrence Details

**Occurrence Number:** 105G 141
**Occurrence Name:** Vermillion
**Occurrence Type:** Hard-rock
**Status:** Prospect
**Date printed:** 12/17/2025 10:10:43 PM

## General Information

**Secondary Commodities:** lead, zinc
**Deposit Type(s):** Volcanogenic Massive Sulphide (VMS) Kuroko Cu-Pb-Zn
**Location(s):** 61°21'48" N - -131°33'12" W
**NTS Mapsheet(s):** 105G05
**Location Comments:** .5 Kilometres
**Hand Samples Available:** No
**Last Reviewed:**

### Capsule

Work History

The area surrounding the occurrence had been explored but never staked, since the mid 1950's when Newmont Exploration of Canada Ltd discovered the neighbouring Wolf (Hasselberg, Minfile Occurrence #105G 008) deposit.
Staked within Fox cl 1-181 (YB96912) in Mar/90 by Cominco Ltd. The Fox claims surround the Wolf claims (which covered the Wolf deposit) and extended 20 km along strike to the northwest. Cominco carried out a reconnaissance scale exploration program later in the year.
In 1991 Cominco optioned the Wolf claims from YGC Resources Ltd and carried out soil sampling and minor geological mapping on the claims. In 1992 following completion of UTEM and magnetometer geophysical surveying, Cominco dropped its option and returned the claims to YGC.
In 1997 Cominco participated in a joint helicopter-borne EM/Mag/VLF geophysical survey with Pathfinder Resources Ltd, Atna Resources Ltd and YGC Resources Ltd, all of whom held claims in the area.
In 1998 J. Hunt of the Yukon Geology Program undertook a field mapping and stratigraphic study of the area.
Atna Resources Ltd optioned the Fox claims from Cominco in the spring of 1998 and carried out geological mapping, geochemical sampling, Max-Min EM geophysical surveying and drilled 4 holes (946.8 m) later in the year. J. Hunt of the Yukon Geology Program also undertook a field mapping and stratigraphic study of the area during 1998.

Capsule Geology

The area is located in the Pelly Mountains southwest of the Tintina Trench. The occurrence lies at the southeastern end of the Pelly Mountains volcanic belt, an arcuate belt of rocks measuring about 80 km long and up to 25 km wide that forms part of the Pelly-Cassiar Platform. In the 1970's several volcanic massive sulphide (VMS) deposits (Minfile Occurrence #105F 012, etc) were discovered at the northwest end of the belt. After several years, interest in the belt waned, but interest was rekindled with the discovery of the Kudz Ze Kayah (Minfile Occurrence #105G 117) and Wolverine (Minfile Occurrence #105G 072) deposits in time-correlative strata in the Finlayson Lake area located to the east.
Rocks of the Pelly Mountain volcanic belt are considered to be Late Devonian to Early Mississippian. The belt unconformably overlies cliff-forming carbonate and limey siltstone/shale that range from probable mid-Silurian to Middle Devonian age. The volcanic belt is overlain by coarse-grained sandstone and grit, argillite and massive rusty weathering carbonate which have been interpreted as Ordovician Road River and (?) Earn Group-equivalent strata that has been thrust over the volcanic package, however this contact is not directly exposed.
In 1998 J. Hunt of the Yukon Geology Program carried out detailed geological mapping following the discovery of the nearby Wolf deposit (Minfile Occurrence #105G 008) in 1997. Results from this study show that the southeast end of the belt is made up of dominantly felsic volcaniclastic strata. The base of the succession consists of dominantly brown-pink lapilli tuff interbedded with argillite and lesser trachyte sills/dykes. The middle of the succession is made up primarily of heterolithic lapilli tuff with distinct argillite clasts, maroon matrix tuff with green lapilli-sized fragments and trachyte flows/sills/dykes; the upper part consists of chlorite-altered volcaniclastic rocks containing intermediate dykes and flows. The Wolf deposit is hosted within the middle portion of the volcanic succession proximal to a syenite intrusion. To the west, towards the centre of the volcanic belt the felsic volcaniclastic component decreases as the number of sills, flows and dykes becomes more numerous, and the amount of intermediate volcanic material increases.
Regionally, bedded barite and massive sulphide showings occur in Late Devonian to Early Mississippian intermediate to felsic pyroclastic rocks and minor flows which overlie thick-bedded mid-Silurian to Middle Devonian carbonate rocks. These volcanic rocks are in turn unconformably overlain by coarse-grained sandstone and grit, argillite and massive rusty weathering carbonate thought to be Ordovician in age. The Mississippian volcanic tuffs, breccias, and flows range from trachyte to andesite in composition and are host to the Wolf deposit located about 1 km southeast of Mount Vermillion. Geological mapping carried out by Cominco in the Mt Vermilion area showed that the Devonian to Mississippian strata appears to be continuous, with minor offsets along north-northeast cross faults. Footwall rocks consist of massive andesitic tuff and the hanging wall consists of rhyolite tuff and quartz-feldspar porphyry flows with pervasive potassium feldspar-sericite-clay-carbonate alteration. Lenses of bedded barite with wispy disseminated pyrite, sphalerite and galena occur near the top of the altered hanging wall rhyolite within strongly altered rhyolite lapilli-tuffs and porphyritic flows.
According to Hunt (1999) the occurrence is located about 4 km northwest of Mount Vermilion and consists of massive sulphide boulders in a creek that are believed to originate from an outcrop located about 250 m upstream. The boulders contain massive pyrite several centimetres thick in fine-grained, silicified trachyte and massive ¿frothy¿ pyrite with fragments of trachyte. Of three rock samples collected by Hunt (2002), one float sample returned a high of 765 ppm Pb, 14 ppm Zn.
Previously, Amax of Canada Ltd located a 10 m wide pyritic agglomerate unit with trace sphalerite approximately 500 m to the southwest of the outcrop located by Hunt. A stream sample collected by Amax, upstream of the pyritic float discovered by Hunt yielded 490 ppm Pb and 720 ppm Zn. Soil samples collected in the vicinity by Cominco returned weakly anomalous values for Pb-Zn. The package of undifferentiated volcanic rocks in the area consists of trachyte flows, sills and dykes; heterolithic lapilli tuff with argillite clasts; and maroon and green heterolithic lapilli tuff. The volcanic package is in fault contact with grey weathering lustrous tuffaceous slate.
Geological mapping and prospecting carried out by Atna in 1998 failed to locate any base metal mineralization on the Fox property. The favourable stratigraphy that hosts the adjacent Wolf deposit extends across the southern part of the Fox claims and has very significant associated soil anomalies. However, alteration and pyrite mineralization weakens along strike to the northwest and neither airborne or ground EM geophysical surveying detected any conductors that correlate with the geochemical anomalies. No significant massive sulfide mineralization was intersected during drilling, although the results of lithogeochemical sampling of the core indicates the presence of weakly mineralized horizons. This mineralization does not appear though to be high enough to fully account for the strength of the soil geochemical anomalies in this area.

References

ATNA RESOURCES LTD and YGC RESOURCES LTD, May/99. Assessment Report #093955 by B. Lo.

ATNA RESOURCES LTD, Oct/99. Assessment Report #094034 by P. Holbek.

AMAX OF CANADA LTD, Jul/83. Assessment Report #091465 by F.R. Harris.

COMINCO LTD, Apr/91. Assessment Report #092952 by P.A. MacRobbie.

HUNT, J.A., 1998. Preliminary Geological Map of the Mount Vermillion Area, Southern Yukon, (Parts of 105G5 and 105G6), 1:25 000 scale. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Open File 1998-5.

HUNT, J.A., 1999. Preliminary stratigraphy and distribution of Devono-Mississippian massive sulphide-bearing volcanic rocks in the Mount Vermillion (Wolf) area, Pelly Mountains (105G/5 and 105G/6), southeast Yukon. In: Yukon Exploration and Geology 1998, C.F. Roots and D.S. Emond (eds.), Exploration and Geological Services Division, Indian and Northern Affairs Canada, p.73-89.

HUNT, J.A., 2002. Volcanic-associated massive sulfide (VMS) mineralization in the Yukon-Tanana Terrane and coeval strata of the North American miogeocline, in the Yukon and adjacent areas. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Bulletin 12, 107 p.

PATHFINDER RESOURCES LTD et al, Apr/98. Assessment Report #093789 by B. Lo.

YUKON EXPLORATION AND GEOLOGY 1997, p. 18, 37-38; 1998, p. 18-19, 29-30.

## Work History

| Date | Work Type | Comment |
|---|---|---|
| 12/31/1998 | Drilling | Four holes, 946.8 m. |
| 12/31/1998 | Geology | |
| 12/31/1998 | Geochemistry | |
| 12/31/1998 | Ground Geophysics | (Max-Min) survey. |
| 12/31/1997 | Airborne Geophysics | Also VLF-EM survey. Participated in regional helicopter-borne geophysical survey with other claim holders in area. |
| 12/31/1990 | Geochemistry | |
| 12/13/1992 | Ground Geophysics | Also UTEM survey. |
| 12/13/1991 | Geology | |
| 12/13/1991 | Geochemistry | |

## Assessment Reports that overlap occurrence

| Report Number | Year | Title | Worktypes | Holes Drilled | Meters Drilled |
|---|---|---|---|---|---|
| 096999 | 2016 | 2016 Geophysical and Geochemical Report on the Wolf Property | Magnetic - Airborne Geophysics, VTEM - Airborne Geophysics, Drill Core - Geochemistry | | |
| 094034 | 1998 | 1998 Assessment Report (Geology, Geochemistry, Geophysics, Drilling) on the Fox Property | Diamond - Drilling, Diamond - Drilling, Soil - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Detailed Bedrock Mapping - Geology, EM - Ground Geophysics, EM - Ground Geophysics, Line Cutting - Other | 8 | 1893.60 |
| 093983 | 1998 | Geological & Geochemical Report on the Starr Property | Rock - Geochemistry, Silt - Geochemistry, Soil - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Detailed Bedrock Mapping - Geology, Prospecting - Other | | |
| 093789 | 1997 | Report on a Combined Helicopter-Borne Electromagnetic, Magnetometer and VLF-EM Joint Aerodat Survey Wolf Deposit and Nearby Belt Yukon Territory | Electromagnetic - Airborne Geophysics, Magnetic - Airborne Geophysics | | |
| 092952 | 1990 | Assessment Report, Soil Geochemistry, Fox Property | Soil - Geochemistry | | |
| 091465 | 1982 | 1982 Geological, Geochemical Assessment Report | Rock - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology | | |