860772

ecstall

..ID:

NAME	: Ecstall	MINFILE	: 103H011
		ARCHER, CATHRO	:
TYPE	: Kuroko	PDI FILE	: 037870
COMMODITY	: Fe, Zn, Cu		
STATUS	: Developed Prospect		
		NTS	: 103H 13/E
RANKING	: Excellent	UTM NORTHING	: 59695218
PRIORITY	: 2	UTM EASTING	: 466395

..SETT:

TERRANE	: Alexander	UNIT	:
GROUP	:	AGE	: Permian
FORMATION	:		

..SYNP:

The Ecstall deposit is a lenticular, subvertically dipping, 6.9 million tonne Kuroko-type massive sulphide having an average grade of 0.65% Cu, 2.5% Zn, 42.4% Fe, 48.5% S, 18.7 g/t Ag and 0.5 g/t Au. The deposit lies in the stream bed of Red Gulch, immediately north of the Ecstall River about 72km southwest of Prince Rupert. The deposit is hosted in a 60km long by 8km wide pendant of middle greenschist and lower amphibolite grade metamorphosed volcanic and sedimentary rock. Host rock is considered to be Permian in age and may be an allochthon of Alexander terrane. The deposit is enveloped by quartz-sericite schist and is bounded on its western flank by quartz-biotite gneiss and a felsic volcanic breccia. These units may have hosted the vents which produced the sulphide deposit. Geological and geophysical exploration programmes by Falconbridge Ltd. in 1986 and '87 were inadequate.

..RECC:

The Ecstall deposit lies within a volcano-sedimentary belt with high probability of hosting additional massive sulphide bodies. Given data currently available to the public it appears that Falconbridge Ltd. carried out a limited exploration programme in 1986 and '87. Ground geophysics should have been carried out over all metavolcanics. Subtle geophysical anomalies on strike with the deposit should have been tested by diamond drilling. PDI personnel should make inquiries to Falconbridge Ltd. as to the availability and terms of acquisition of the Ecstall property.

..EXPL:

1900	British Columbia Pyrites Ltd. - deposit discovered and purchased by Victoria interests.
1901-02	British Columbia Pyrites Ltd. - Tunnelling and drilling carried out.
1917-18	The Granby Mining Smelting and Power Company Ltd. - Diamond drilling.
1923	The Granby Mining Smelting and Power Company Ltd. - Diamond drilling.
1937-39	Northern Pyrites Ltd. - 898m long 2.9 by 2.6m adit, 7 crosscuts 234m, 193m raise at 60 degrees.
1952	Sulgas properties Ltd. - 444m surface diamond drilling, 2867m underground diamond drilling, geological reconnaissance, ground geophysics (VLF?).
1957-60	Ecstall Mining Company Ltd. - Ground geophysics, reconnaissance geology, discovery of Packsack and Scotia deposits.
1968	Texas Gulf Sulphur Co. - Geological reconnaissance, discovery of Horsefly deposit.
1985-87	Kidd Creek Mines Ltd. - Airborne geophysics (INPUT, mag., 36km), geological mapping, lithogeochemical sampling, ground geophysics (Max Min, mag), soil geochemical survey, 5 DDH 916m

..EXAD:

Excellent - Underground exploration and diamond drilling has given a good approximation of the dimensions and base and precious metal contents of the sulphide bodies. Exploration for additional, higher grade base metal deposits on the property has been poor. Given the extreme topography of the property the 1985 Questor airborne geophysical survey was extremely hampered. The Ecstall deposit did not give a geophysical response due to excessive altitudes required during the survey. The absence of geophysical responses therefore does not imply that sulphide mineralization is not present elsewhere on the property. An inadequate amount of ground geophysics and diamond drilling of anomalies has been performed over most parts of the property.

..PDIF:

L. Adie of Canex Aerial Exploration Ltd. reviewed a report covering the reappraisal of the economics of the Ecstall deposit in 1967. He indicated that Canex was not pursuing negotiations with Texas Gulf Sulphur regarding the acquisition of the property given its poor economics. R.H. Pinsent reviewed a property submittal by C.W. Graf of Ecstall Mining Corporation in early 1990 (PDI File # 378810). The Packsack, Horsefly and Steelhead mineral occurrences (12km southwest of the Ecstall deposit) were recognized as being volcanogenic in nature but were considered to be of low priority given their low base and precious metal contents. PDI declined to participate in a venture but indicated that personnel would appreciate the opportunity to view the property later in the year.

..CURR:

The Ecstall deposit is covered by a series of Crown grants under title to Kidd Creek Mines Ltd.

..DESC:

The Ecstall deposit is situated in Red Gulch, a deeply incised stream gorge immediately north of the Ecstall River. The deposit is 72km southeast of Prince Rupert and 94km southwest of Terrace. The deposit lies within a 4 to 15km wide and at least a 60km long north-northwest trending pendant of metasediments, metavolcanics and granitoid gneisses. The pendant is bounded on the west by Coast Range quartz diorite, granodiorite, and diorite and on the east by a complex migmatitic zone up to 5km wide. It consists mainly of hornblende-plagioclase amphibolite schists with lesser amounts of quartzite, marble, migmatite and granitoid rocks of late Paleozoic or early Mesozoic age (Hassard et al; 1987). North of Big Falls Creek rock has undergone amphibolite facies metamorphism while to the south rock has undergone middle greenschist to lower amphibolite grade metamorphism.

The Ecstall pendant currently hosts three subeconomic massive sulphide deposits. These are the Ecstall, Packsack and Scotia deposits.

LOCAL GEOLOGY:

The geology of the Ecstall deposit and its host units are described in detail by Hassard et al; (1987). In the vicinity of the Ecstall deposit the Ecstall pendant is 8km wide and trends 170 degrees. The contact between the Coast Plutonic Complex granitoids and the pendant rocks is reported to be sharp. The pendant rock is strongly deformed and metamorphosed to middle greenschist facies. Most volcanic and sedimentary textures have been obliterated.

The Ecstall deposit consists of two lenticular bodies of massive pyrite referred to as the North and South Lenses. They strike north-south, dip steeply east and plunge steeply south. They occur en echelon and in places are less than 10m apart. The North Lens is 290m long, has a maximum width of 30m and extends 230m beneath Red Gulch. The South Lens is 400m long, less than 15m in width and extends at least 340m below Red Gulch.

The sulphide occurrences outcrop in Red Gulch. The deposits are composed of fine to medium grained, euhedral to subhedral crystallinity pyrite hexahedrons and pyritohedrons.

Pattison and Uher (Hassard et al; 1987) subdivided the volcano-sedimentary sequence exposed in the Ecstall pendant into a number of mappable units from which protoliths could frequently be ascertained. Chlorite

schist, quartz-chlorite schist, quartz-chlorite-biotite schists have been interpreted as representing metamorphosed equivalents of mafic and intermediate composition flows and volcaniclastics. Locally, 40cm wide by 60cm long pillows can be identified in the chlorite schist. Banding in the latter two units suggests that their protolith may have been volcaniclastics or reworked volcanics.

Quartz-biotite gneiss is a fine to medium-grained felsic composition rock composed of quartz and biotite with variable amounts of chlorite and plagioclase. The unit is in sharp contact with a felsic volcanic breccia and is reported to be close to the eastern wall of the Ecstall Deposit. Hassard et al; (1987) suggested that the quartz-biotite gneiss is an intrusive rock. Given that the foliation in the gneiss is parallel to that displayed within volcano-sedimentary rock in the vicinity of the deposit, that it is morphologically distinct from the Coast Plutonic Complex granitoids, and that it is associated with compositionally similar felsic volcanic breccia suggests that the unit was emplaced synchronously with other volcano-sedimentary rocks within the pendant. The unit may represent a footwall hypabyssal intrusion.

The felsic volcanic breccia is similar in composition to quartz-biotite gneiss. It consists of 2 to 20cm long, angular felsic fragments supported by a dark, fine-grained chloritic matrix. The fragments are stretched parallel to foliation. Fragments account for about 20 to 50% of the mode.

Clastic metasedimentary rock comprise greywacke, quartzite, and argillite. Marble and chert units are intimately associated with sulphide mineralization. Marble has been traced for up to 800m. The unit is locally up to 5m in thickness. Chert units are consistently less than 50cm in thickness. Pyrite mineralization is frequently associated with the unit. Pyrite can be in the form of disseminations or can be semi-massive to massive.

Quartz-sericite schist envelopes the Ecstall massive sulphide deposit as well as other exposures of massive sulphide on the property. It is described as being a highly sheared, buff coloured, felsic composition rock. It is composed of quartz and white mica with trace pyrite (<5%). The unit is up to 120m in thickness and can be traced for up to 5km. It is often interbedded with argillite.

ALTERATION:

Hassard et al; (1987) carried out a preliminary lithogeochemical investigation into the association of altered lithologies and massive sulphide mineralization. The study was based on the premise that the lithologies sampled at the Ecstall property would have elemental and major oxide modal abundances similar to those seen hosting massive sulphide deposits in less metamorphosed recent and ancient geological terranes.

The degree of alteration within specific lithologies was based on Na, Sr ,Mg, Cr contents and Ishikawa Alteration indices. The reader is referred to Figures 9 and 10 in the British Columbia Ministry of Mines and Petroleum Resources Assessment Report 15,488 for specific locations of altered samples.

In the vicinity of the Ecstall deposit all samples of quartz-sericite schist were found to be strongly Na and Sr depleted and were found to have Ishikawa Alteration indices greater than 80. West of the host quartz-sericite schists, chloritic schists were not found to be strongly altered. The interface between the quartz-sericite schists and the chloritic schists is marked by a thin, discontinuous, strongly chloritized zone. Hassard et al; (1987) indicate that the chloritic schists are locally weakly carbonatized and silicified. The quartz-biotite gneiss only a few metres east of the deposit is weakly chloritized.

The Thirteen Creek Cirque - West Grid Alteration Zone is a 2.7 square kilometre area in which the metavolcanic rocks are strongly chloritized, sericitized and silicified. Disseminated and stringer type pyrite-chalcopyrite mineralization is throughout the metavolcanics. Kyanite porphyroblasts in quartz-sericite schist in the southwest corner of the cirque suggest that thermal effects from the Coast Plutonic Complex has resulted in the production of macroscopic alumino-silicates which reflect the bulk composition of the alteration zones. All samples of quartz-sericite schist taken from the Thirteen Creek Cirque - West Grid Alteration Zone have Na2O contents in excess of 1.00%. Ishikawa Alteration indices range up to 73. The quartz-chlorite-biotite schists have AI values from 60 to 70 and are reported to be rarely Na or Sr depleted.

..METD:

Metal distribution within the Ecstall deposit has not been discussed by any previous author. Field observations by D.G. Mallalieu indicate that at least locally sphalerite occurs as 2-3cm thick, yellow-purple bands hosted within massive granular pyrite. The nature of the chalcopyrite mineralization was not ascertained.

Peatfield (1988) reports that the Ecstall deposit contains a coherent zone of about 350 000 tonnes grading nearly 2% Cu, 16 g/T Ag and 0.6 g/T Au.

..RSRV:

North Lens

	Cu	Zn	Fe	S	Ag	Au
3.1mt	0.80%	2.0%	43.5%	49.5%	17.1g/t	0.5g/t

South Lens

3.8mt	0.5%	3.0%	41.3%	47.6%	20.2g/t	0.5g/t

Reserve estimates taken from Hassard et al; 1987.

..DISC:

The confirmed association of massive sulphide mineralization with quartz-sericite schist at the Ecstall deposit as well as at local outcrops of massive sulphide has biased current exploration efforts. More recent geological exploration programmes have been focused on the quartz-sericite schist units on the basis that it is solely capable of hosting deposits.

The North and South Lenses of the Ecstall deposit may be overlying a quartz-biotite gneiss and a felsic volcanic breccia. These units may represent a felsic hypabyssal intrusion and a possible in-situ, hydrostatically brecciated felsic volcanic or pyroclastic respectively. These units may have hosted the vents which evolved the sulphides which accumulated to form the present lenses. Identification of additional quartz-biotite gneisses could lead to the detection of other proximal massive sulphide deposits.

Quartz-biotite-chlorite schist/quartz-chlorite-biotite schist, quartz-chlorite schist and chlorite schist account for a substantial volume of rock on the property (>25%?). Differences in metamorphic mineral assemblages between the units could be indicative of local variations in volcanic and/or sedimentary component of a generally homogeneous volcanic or volcaniclastic. Differences in mineralogies could also be a function of the superposition of late stage metamorphism on a hydrothermally altered lithology. These lithologies could host massive sulphide deposits distal to feeder zones. Petrographic analysis of units mapped on the basis of their metamorphic mineral assemblage could assist in the identification and discrimination of protoliths with greater or lesser probabilities of hosting VMS deposits.

Diamond drilling of the Ecstall deposit in 1952 indicated that massive sulphide mineralization is present to depths of at least 340m below surface. It is fortuitous that the Ecstall deposit outcrops. If an equivalent deposit were situated at a depth of 300m it's geophysical response would be highly diluted. A deposit at a shallower depth but with a more substantial sphalerite content would also be expected to produce a mild geophysical response.

The conductors detected under the swamp south of the Ecstall deposit require further investigation. Hendrickson (1987) indicated that results obtained from the HLEM survey were consistent with a large conductive body at depth. As this anomaly is directly on strike with the Ecstall deposit there is a greater probability that the anomaly is caused by sulphide mineralization as opposed to metasediments.

The massive pyrite deposits in the Ecstall River belt have a similar tectonic setting, similar host lithologies and nearly identical mineralogies to massive sulphide deposits in the Iberian Pyrite Belt. Deposits in both locales are dominantly massive pyrite but are accompanied by other base metal sulphides, mainly chalcopyrite, galena and sphalerite. Copper, lead and zinc sulphides typically do not exceed five percent of the total. Locally within the pyrite deposits of the Iberian Pyrite Belt there are layers and lenses of base metal sulphides, these lenses typically have metal values in the range of 0.4 - 1.5% Cu, 1 - 2% Pb, 2.5 - 5% Zn, 0.4 - 0.8% As, 0.01 - 0.06% Sn, 0.5 - 1.0 g/t Au and 40 -60 g/t Ag (Strauss et al; 1986). The Neves-Corvo deposit is an example of a high grade base metal deposit hosted within a belt which has historicallly produced pyritic massive sulphide deposits. Neves-Corvo consists of four flat-lying bodies having estimated total reserves of 100 million tons. One part of the deposit contains 34 million tons of high grade copper ore grading about 8% Cu, 44 g/t Ag, 0.4% Zn and traces of Pb. The ore horizon is 1.5 to 4m in thickness and forms the stratigraphic hangingwall to massive pyrite.

The Ecstall River belt is known to host significant tonnage pyrite deposits, it is underexplored, and on the basis of similarities to deposits of the Iberian Pyrite Belt there is further potential for the detection of higher grade base metal deposits.

..NOTE:
A substantial amount of information regarding the geology of the Ecstall deposit is not available to the public. The geology of the deposit would be much better understood if the 1937-39 underground data as well as the 1952 diamond drill data were entered into a computer and manipulated and re-evaluated using exploration software.

REFR:
Hassard et al; 1987
Hendrickson, 1987
Peatfield, 1988
Strauss et al; 1986

AUTHOR : D.G. Mallalieu
DATE : 90-07-27
REV. :