

FALCONBRIDGE NICKEL MINES LIMITED  
 Metallurgical Laboratories  
 Thornhill, Ontario

MINERALOGY SECTION  
REPORT NO. 317

TO: Mr. C.R. Elkington  
 FROM: R. Buchan  
 DATE: March 31, 1964

RE: Mineralogical Study of 9 Specimens from Tasu Area, B.C.

Introduction:

A suite of 9 rock samples from the vicinity of the Tasu orebody was submitted on March 13th by Mr. C.R. Elkington for petrographic examination in thin section. They were stated to represent varieties of host and dyke rock with which the ore is associated. Questions were asked on the classification of the rocks and alteration types possibly related to ore emplacement.

Ten thin sections were cut and examined.

Lab. #4423  
TS #1786

"Sample MP 2"

<u>Minerals</u>		<u>Est. % by vol.</u>		<u>Avg. Grain Size</u>
Feldspar	An <sub>30</sub>	40	phenocrysts	1.00 m.m.
Quartz		20		0.10
Apatite		< 1		0.04
Sphene		< 1		0.08
Chlorite		5	patches	0.20
Sericite		13		
Carbonate		20	patches	0.15
Opaque oxides and sulphides		1		0.10

Coarse phenocrysts of feldspar of composition An<sub>30</sub> are very heavily sericitized and in some cases completely masked. They are set in a matrix consisting mainly of quartz, with minor sphene, chlorite and apatite. Secondary carbonate is quite prolific throughout the section in patches and occasionally in late massive veinlets. Some quite fresh feldspar, of the same composition as the phenocrysts, occurs with quartz in the matrix.

On the basis of mineral composition and texture, the rock is classified as a feldspar porphyry which has been carbonatized and has undergone alteration to sericite.

Lab. #4424

TS #1787

"Sample MP 5"

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Feldspar (phenocrysts An <sub>30</sub> )	55	1.40 m.m.
(groundmass An <sub>52</sub> )		0.10
Quartz	20	0.03
Apatite	< 1	0.08
Sphene	1	0.10
Chlorite	4	
Sericite	5	
Epidote	2	0.08
Carbonate	10	
Opaque sulphides and oxides	2	0.05

Phenocrysts of quartz (a few only) and feldspar, An<sub>30</sub>, are set in a very fine grained groundmass consisting of quartz, feldspar, apatite, sphene and chlorite. The feldspar of the groundmass is very unusual in that it is very calcic, of composition An<sub>52</sub>. This may be due to recrystallization during a period of calcic metasomatism. The coarse phenocrysts are partly sericitized and they exhibit a synneusis texture, i.e. clusters of coarse feldspar grains grow together to form a large area of phenocryst.

Carbonate is prevalent again, occurring in patches and late veinlets with quartz. Most of the opaque minerals consist of pyrite which is evident in hand specimen. This rock is similarly classified as a carbonatized feldspar porphyry, showing possible effects of hybridization by limestone assimilation.

Lab. #4425

TS #1788

"Sample MP 9"

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Feldspar An <sub>30</sub>	70	0.80 m.m.
Quartz	16	0.06
Apatite	1	0.10
Sphene	2	0.08
Sericite	4	0.05
Epidote	Tr	
Carbonate	7	0.12
Opaque sulphides and oxides	Tr	0.04

This section is very similar to TS 1786, sample MP 2, but shows less sericitization of feldspar and much less carbonate. No chlorite is present at all, suggesting that areas of altered ferromagnesian minerals have been carbonatized. The quartz matrix has approximately the same grain size as TS 1786 but feldspar phenocrysts are much more prolific in TS 1788. The rock is classified as a partly altered and carbonatized feldspar porphyry.

Lab. #4426

TS 1789 A and B

"Sample FZ 2"

This sample of diamond drill core shows a banded siliceous rock, pale grey in colour, with late crosscutting carbonate veinlets.

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Quartz	50	0.01 m.m.
Talc	15	
Carbonate	35	0.12

Very fine grained bands consisting of mosaic quartz and talc are carbonatized. The talc occurs in discrete laths, up to 0.04 m.m. long, which are well disseminated through the rock. Carbonate occurs as rounded grains as well as in late crosscutting veinlets.

On the basis of mineral composition and texture, the rock is classified as a carbonatized, fine grained quartzite.

Lab. #4427

TS #1790

"Sample FZ 3"

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Quartz	55	< 0.01 m.m.
Saussurite-epidote	18 patches	0.08
Carbonate	25	
Sulphides and oxides	2	0.08

Very fine grained quartz forms the groundmass of this section. Apart from the opaque minerals, the rest of the assemblage consists of secondary development of epidote-saussurite and carbonate. Brown saussuritic masses and occasional grains of clear epidote possibly signify the product of alteration of feldspar. Carbonate is prolific throughout the section, often in crisscrossing veinlets with secondary quartz.

On the basis of texture and mineral assemblage, the rock is classified as a carbonatized, altered quartzite.

Lab. #4428

TS #1791

"Sample FZ 6"

In hand specimen, this pale grey siliceous rock shows a banded appearance with a 1/4" dark grey band set in a pale grey host.

	<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
<u>Pale grey</u> <u>Band</u>	Feldspar	60	0.35 m.m.
	Quartz	27	0.06
	Apatite	Tr	0.04
	Sericite	8	
	Carbonate	4	
	Sulphides and Oxides	< 1	0.10
<u>Dark grey</u> <u>Band</u>	Quartz	76	0.06 m.m.
	Sericite	20	
	Carbonate	1	0.10
	Sulphides and Oxides	3	0.15

The pale grey band shows typical porphyry texture with several coarse phenocrysts set in a relatively medium-grained groundmass of quartz, feldspar and apatite. It is weakly carbonatized and most of the feldspar is partly sericitized.

The dark grey band appears to have developed along a line of weakness or fault zone in the main rock type. This is borne out by the development of relatively coarse grained pyrite and secondary quartz in the centre of the band. From the textural evidence, the band is apparently the result of a late stage infilling by material related to the original porphyry, consequently the feldspar is now represented by sericite which is well disseminated through the zone.

On the basis of texture and mineral composition, the rock is classified as a feldspar porphyry, showing results of deuteric action which produced a banded effect.

Lab. #4429  
TS #1792

"Sample FZ-7"

<u>Mineral</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Feldspar An <sub>30</sub>	57	0.50 m.m.
Quartz	35	0.03
Apatite	Tr	0.03
Sphene	Tr	0.06
Sericite	4	
Chlorite	<1	
Carbonate	2	
Oxides and Sulphides	<1	0.04

This is a fairly typical porphyry section showing phenocrysts of sericitized feldspar set in a fine grained groundmass of quartz-feldspar. Accessory minerals (apatite, sphene, chlorite) are minor and carbonate is less prevalent than in other sections.

The rock is classified as a feldspar porphyry.

Lab. #4430  
 TS #1793

"Sample GP-2"

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Feldspar (An <sub>35</sub> ( <sup>+</sup> An <sub>34</sub> )	90	phenocrysts 0.90 m.m. groundmass 0.10
Apatite	Tr	0.02
Sphene	1	0.04
Chlorite	1	
Sericite	2	
Carbonate	5	0.10
Oxides and Sulphides	< 1	0.04

Feldspar phenocrysts, quite fresh except for minor sericitization, are set in a groundmass consisting of almost the same composition, viz., laths of feldspar <sup>+</sup>An<sub>34</sub>. No quartz is evident in the section but accessory minerals apatite, sphene, and chlorite are identical to those described in previous sections. Carbonate is prevalent through the sample as in other sections.

On the basis of texture and mineral composition, the rock is classified as a feldspar porphyry (quartz free).

Lab. #4431  
 TS #1794

"Sample DP-8"

<u>Minerals</u>	<u>Est. % by vol.</u>	<u>Avg. Grain Size</u>
Feldspar An <sub>25</sub>	55	phenocrysts 0.80 m.m. groundmass 0.15
Quartz	12	0.12
Sphene	Tr	0.06
Chlorite	10	patches 0.10
Epidote	10	0.10
Carbonate	Tr	
Sulphides and Oxides	3	0.08

This is a very heavily epidotized feldspar porphyry showing altered phenocrysts set in a relatively coarse grained feldspar, quartz, chlorite, sphene matrix. The composition of the feldspar is An<sub>25</sub>, oligoclase, much more sodic than rocks previously described. The texture of the groundmass also differs from the mosaic quartz-feldspar of previous sections. In TS 1794, quartz and chlorite patches are interstitial to elongated feldspar laths in the groundmass.

On the basis of texture and mineral composition, the rock is classified as an epidotized feldspar porphyry.

Summary:

The following table summarizes the results of this petrographic examination.

<u>Lab. #</u>	<u>Sample #</u>	<u>Classification</u>	<u>Remarks</u>
4423	MP 2	Feldspar porphyry	
4424	MP 5	Feldspar porphyry	Possible hybridization effects
4425	MP 9	Feldspar porphyry	Quite similar to MP 2
4426	FZ 2	Quartzite	
4427	FZ 3	Quartzite	Probably originally feldspathic
4428	FZ 6	Feldspar porphyry	Shows deuteric effects
4429	FZ 7	Feldspar porphyry	
4430	GP 2	Feldspar porphyry	Quartz-free
4431	DP 8	Feldspar porphyry	Sodic plagioclase

Conclusions:

Since we have no first hand knowledge of the problems of petrography involved in the Tasu orebody, any conclusions regarding the relationships of host rock to ore emplacement should be made by the field geologist. It is recommended, however, that in future studies of this kind, a detailed sketch map showing sample location and any other pertinent geological information should accompany the specimens. This would form a basis for our understanding of the problems involved.

*R Buchan*

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RB/et

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C.R.E. (2)  
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