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Report For: Lee C. Pigage
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Samples: 79V046R: 146-156, 177-182.7, 184.9-197.8,
79V046R: 162.5 - 184.3, 202.0-209.6, 215.5-221.0,
79V046R: 216.0-221.6, 256.6-267.0,
79V026R: 114-138,
88V17: 25.2-33.5, 36-42
(11 Polished Thinsections)

Summary:

These specimens represent typical examples of waste phyllites and low grade quartzose "ores" from the Vangorda deposit in the Anvil District, Yukon. Waste dumps from future mining operations will be composed of similar material.

The altered phyllites are all similar in mineral composition and texture. They consist primarily of muscovite and quartz with minor chlorite and carbonate. Accessory minerals are plagioclase, orthoclase and opaque minerals. The opaque (or reflecting) minerals are dominated by pyrrhotite with lesser amounts of pyrite, hematite, sphalerite and magnetite. Traces of chalcopyrite were noted.

Muscovite occurs as large felted lenses up to 6 mm long by 3 mm wide and as thick monomineralic layers up to 8 mm wide. The thick muscovite layers are kinked at close intervals which gives a rough chatoyancy to the sawn surfaces. Chlorite often replaces muscovite and is often associated as envelopes around pyrrhotite grains. The quartz dominant layers are composed mainly of elongated interlocking quartz grains (0.05 mm to 0.2 mm) associated with minor, strongly aligned muscovite needles averaging 0.1 mm in length. Irregular, small chlorite patches (up to 0.15 mm) are common. Differentiating between muscovite and the possibility of talc would require XRD analytical work, but it is my opinion from the handspecimen inspection and mineral association that the vast majority of the layer silicates are muscovite.

Pyrrhotite occurs as large irregular lenses. They have undergone metamorphic stress and conform to the microfolds of the adjacent muscovite layers. Pyrrhotite also forms long, fracture-filling veinlets. In some samples (79V046R 177-182.7) sphalerite is the dominant reflecting mineral. Chalcopyrite is usually present in trace amounts as tiny inclusions in other sulfides.

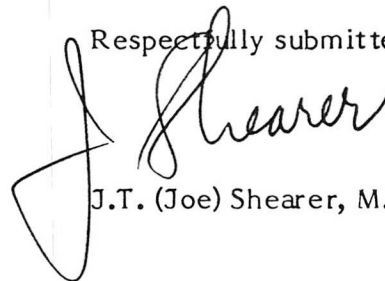
Some specimens appear to contain both calcite and ferroan dolomite (ankerite) in very small quantities. A definitive determination of the carbonate composition would require detail XRD analytical work. The amount of carbonate is relatively low. However, the attached individual descriptions have indicated a ferroan dolomite (ankerite) composition if the mineral is brown stained, has associated opaques, and low degree of reaction to HCl in hand specimen. Specimen 79V046R 256.6-267.0 contains the highest ferroan dolomite content (15%). A further test is that dolomite effervesces in warm dilute HCl. On heating the iron rich carbonates decompose into magnetic iron oxides plus carbon dioxide gas. Sample 88V-17 36 - 42 contains abundant calcite (22%).

The "low grade quartzose ores" (samples 79V026R 114-138, 88V-17, 25.2-33.5, 88V-17 36-42) are characterized by their abundance of pyrite in massive bands and fracture veinlets. Pyrite forms subrectangular grains up to 1.3 mm wide which commonly coalesce into semi-massive layers and lenses parallel to foliation. In specimen 88V-17 25.2-33.5 the pyrite grains are connected to each other by irregular seams or lenses of pyrrhotite. Sphalerite is abundant in specimen 88V-17 36-42 in irregular lenses up to several millimetres wide. Chalcopyrite occupies small, narrow cracks or fractures in the larger pyrite layers. Chalcopyrite also forms rare large grains (up to 2.1 mm wide) associated with pyrrhotite and sphalerite. Traces of tetrahedrite were noted in 79V026R 114-138. Sample 88V-17 36 - 42 contains delicately laminated penninite (chlorite) lenses associated with the massive pyrite lenses.

An estimate of possible XRD analytical depends mainly on the ease of preparation of sufficient sample material. If sample preparation is simple, costs per determination can be as low as \$20 to \$50. However, as more time is spent to obtain sufficient sample, the overall cost can be considerably more. The distribution of carbonate in these rocks as thin fracture-filling suggests that preparation of sufficient sample for XRD will be difficult and time consuming.

If you have any questions about the attached descriptions, please contact me at 681-4902. Until I receive your instructions regarding the possible XRD work on the muscovite or carbonate, I will retain samples here in Vancouver.

Respectfully submitted,



J.T. (Joe) Shearer, M.Sc.

TABLE 2 PETROGRAPHY SAMPLES FOR SULPHIDE WASTE (VANGORDA DEPOSIT)

DDH	FROM (FT)	TO (FT)	INTVL (FT)	UNIT	
79V-26R	114	138	24	4AO	3% Fe dolomite*
DDH	FROM (m)	TO (m)	INTVL (m)	UNIT	
88V-17	25.2	33.5	8.3	4C37	2% Fe dolomite*
88V-17	36.0	42.0	6.0	4CO	22% calcite**

TABLE 1. PETROGRAPHY SAMPLES FOR WASTE COMPOSITE B (VANGORDA DEPOSIT)

DDH	FROM (m) ft	TO (m) ft	INTVL (m) ft	UNIT	
79V046R	146.0	155.8	9.8	3G48 &6 (po) &2 calc-silicaty	Tr Calcite
79V046R	176.8	182.7	5.9	4L124	6% Fe dolomite
79V046R	185.0	197.8	12.8	3G48 stringered	4% Fe dolomite
79V049R	162.4	184.4	22.0	5B67 &9 &4 [3G48 stringered	5% Fe dolomite*
79V049R	202.1	209.6	7.5	5B6 &4 &9 (po)	6% Fe dolomite
79V049R	215.6	221.1	5.6	4L67 [3G48 spotted/ stringered	18% Fe dolomite*
79V053R	215.9	221.1	5.2	5B648 [3G48] [4L6]	2% Fe dolomite
79V053R	256.6	267.1	10.5	3G48 &9	15% Fe dolomite*

* possibly ankerite

** possibly minor ankerite