Non Geol file

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22 Sept. 1980
Invoice 2212

Mr. Bill Sirola
Kerr Addison Mines Ltd.
703 - 1112 W. Pender St.
Vancouver, B.C.

Dear Mr. Sirola:

Enclosed please find petrographic descriptions for the four drill core samples which you sent to us on 10 Sept.

They have been assigned names as follows:

DDH1 116.5' Metasiltstone o.k.
DDH1 202' Metasiltstone? Salt pepper texture
DDH2 148' Medium grained porphyritic granodiorite
DDH6 326' Carbonate altered siltstone? o.k.

The metasediments in DDH1 show evidence of contact metamorphism which followed regional metamorphism. Both they and the granodiorite have undergone late minor alteration, sulfide mineralization, and veining. I suggest the granodiorite as the source of contact metamorphism and as the "pump" for the hydrothermal alteration and mineralization. Is it big enough?

The extreme foliation and fine grain size of DDH6 326' almost lend themselves to the term "mylonite"; however, considering the textures of the other samples this seems unlikely. It has been affected by post-deformation carbonate veining and alteration, and late hematite development.

Sincerely yours,

J. Nelson

JoAnne Nelson, M.Sc.

DDH 116.5' Metasiltstone

This sample shows a very fine grained texture. The prominent laminations are due to fine quartz segregations. Biotite plates are somewhat oriented, but appear to be partly mimetic. They are subhedral with slightly irregular shapes. This habit most resembles biotites in a regionally metamorphosed rock which has been subsequently hornfelsed.

Mode

36	plagioclase		
20	biotite		
20	quartz		
10	actinolite		
5	Kspar		
4	opaques		
3	Fe-oxides	tr	carbonate (siderite?)
2	Ti-oxide		

Plagioclase and Kspar are very fine grained, occurring in aggregates with biotite and actinolite. Kspar is slightly enriched in some laminae, as is shown by the staining. Light brown biotite forms discrete subhedral plates. Wispy trains contain both oriented and unoriented plates. Quartz segregations and veins define the foliation. Quartz in them is somewhat coarser grained than the average. Actinolite occurs in the matrix with biotite and in separate laminae. It is pale green, forming needles and prisms. It also occurs in quartz segregations as radiating needles and ragged prisms, generally with the opaques.
Opaques form heavy clots in quartz segregations and veins. One vein cuts across the foliation. Its selvages are depleted in biotite and actinolite. Opaques form a line along its center. In some cases opaques form acicular intergrowths with acicular actinolite. Opaque grains are scattered in the matrix.
Fe-oxide bands fill fractures parallel to and across the foliation.
Very fine grained Ti-oxide occurs in clumps and bands, which favor certain lamellae. Beaded sphene clusters and large, subhedral sphene grains occur in quartz segregations.
Carbonate occurs as clumps with the opaques and small scattered grains in quartz segregations.

DDH1 202' Metasiltstone ? Salt + pepper texture

This sample has the same basic minerology and texture as that from 116.5'. It is somewhat coarser grained and less well-laminated. Plagioclase porphyroblasts have formed after regional metamorphism. They grow across biotite trains. Biotite and actinolite show only fair orientation and are partly mimetic on an earlier foliation. This sample probably underwent hornfelsing after regional metamorphism.

The opaque minerals concentrate in a major vein which crosses the thin section at low angles to foliation; and in a poorly-defined quartz segregation of irregular shape. They are associated with chlorite, white mica and sphene, and are surrounded by and intergrown with carbonate. Kspar alteration surrounds the vein. The association of veining and opaques with retrograde phases suggests that mineralization took place after the metamorphic peak, perhaps during an alteration episode that occurred as the intrusion cooled.

Mode

28	plagioclase
25	quartz
15	biotite
10	actinolite
10	opaques (pyrite?)
5	Kspar
3	sericite
2	carbonate
1	chlorite
1	sphene
tr	apatite
tr	clinozoisite

Plagioclase in the matrix is very fine grained. Large porphyroblasts (to .5 mm) are stubby tabular to anhedral with irregular edges. They are all poikilitic, enclosing quartz, small plagioclase grains, and biotite. Some of the biotite occurs in linear patterns which are continuous with small trains in the matrix.
Quartz forms very coarse aggregates in veins, as well as medium grained mosaic segregations.
Small light brown biotite plates are somewhat oriented. In discontinuous trains, they show polygonal, mimetic textures. Most biotites are discrete plates.
Actinolite occurs in the matrix as prisms, bundles of needles, and scattered larger prisms. In places it intergrows with biotite.

DDH1 202' cont.

Opaques in the major vein form clumps of cubes and anhedra. Clumps also concentrate in an area near the top of the section, where they average .5 mm across. Finer grained opaques are scattered in the matrix. They are mostly anhedral. They tend to cluster, and to define short vein-like trends.
Kspar concentrates along the selvages of the main vein, as fine grained mosaic aggregates.
Sericite clumps occur next to large opaque aggregates, and near the main vein. Scattered plates are seen in the quartz segregations.
Carbonate surrounds opaques, and also clusters of sphene crystals which occur near them.
Chlorite forms dense mats near opaque clumps. At a few places in the section it pseudomorphs relatively large biotite plates.
Sphene forms strikingly euhedral crystals which cluster near the large opaque clumps.
A few subhedral apatite grains accompany sphene.
A few clinozoisite grains are present.

DDH2 148' Medium grained porphyritic diorite ? Why not granodiorite ?

This sample consists of phenocrysts of plagioclase, quartz, and biotite in a matrix of Kspar, plagioclase and quartz. Plagioclase phenocrysts range up to 1 cm; the average phenocrysts are 1 to 2 mm across. Average matrix grains are .05 to .2 mm across.

Alteration has been spotty. Plagioclases are variably sericitized. Chlorite and actinolite occur in patches. Opaques generally associate with them, and with epidote and apatite. Most of the mineralization occurs in the matrix, with a few instances of opaque/chlorite penetrating into plagioclase phenocrysts.

Mode

45	plagioclase (An 15-34, cores An 48)
(25)	quartz
15	Kspar
4	sericite
4	biotite
3	opaques (pyrite, pyyrhotite)
2	actinolite
2	chlorite
tr	epidote
tr	apatite
tr	zircon
tr	carbonate
tr	hornblende

Plagioclase forms the largest phenocrysts. They are euhedral to subhedral, with strong normal and oscillatory zoning and complex synneusis-intergrowths typical of plagioclases growing in a melt. Sericitization has been variable. Plagioclase occurs in the matrix in an even mosaic with Kspar and quartz.

Quartz phenocrysts are round in outline.

Red brown biotite plates are euhedral with, in some cases, corroded edges. Some contain round quartz or apatite grains. Alteration to chlorite proceeds along rims and 001 cleavages.

Pyrite forms cubes and anhedra; pyrrhotite is generally interstitial. They occur mostly in association with alteration minerals in clumps, e.g. actinolite, chlorite, epidote, and anhedral apatite.

Actinolite forms clumps of euhedra, anhedra, and interstitial grains. These are partly pseudomorphs of primary hornblende.

Chlorite forms patches and aggregates with other secondary minerals.

Patchy epidote occurs in aggregates with opaques. Wispy epidote occurs in one large chlorite patch.

DDH2 148' cont.

Apatite grains are either euhedral, scattered in the matrix; or anhedral, accompanying secondary minerals. The latter may themselves have crystallized during alteration.
A few zircons are included in plagioclase phenocrysts.
One carbonate grain was seen in a clump with chlorite.
A few small euhedral green hornblendes are included in plagioclase phenocrysts.

DDH6 326' Carbonate-altered siltstone(?) Brecciated meta. andesite

This sample is extremely fine grained and strongly laminated. The white and grey mottling which is visible in hand sample is due to varied concentrations of Ti-oxide. Carbonate alteration has been pervasive. Veins follow and also cut across the foliation. Patchy carbonate develops in the matrix, especially near the veins.

Mode

45	carbonate
20	Ti-oxide
15	muscovite
15	quartz
5	hematite

Carbonate forms very coarse grained aggregates in the veins. A few of the grains are euhedral. It also forms small ragged patches in the matrix; these concentrate near the veins.
A carbonate veinlet which cuts across the foliation also cuts a quartz veinlet.
Ti-oxide forms extremely fine grained streaky aggregates which partly define the foliation.
Small muscovite plates are well-aligned in the foliation. Their abundance varies across the foliation, which probably parallels layering.
Quartz grains in the matrix are interstitial and elongated parallel to foliation. Quartz veinlets and segregations, composed of medium grained mosaic aggregates, tend to follow the foliation.
Hematite forms euhedral blades and, less commonly, anhedral grains. They range from very small to .1 mm long. They occur scattered in the matrix and in clumps. The clumps consist of unoriented prisms. They grow scattered in quartz and calcite veinlets. Some form lensoid accumulations which have long axes in the foliation.