A. I—2 Microscopic Observations (Thin Sections)

Sample No.	Location	Rock Name	Microscopic Observation
S032	Vueltas del Rio	Highly altered andesite	The completely decomposed feldspar crystals give the rock spotted appearance. Under the microscope, little remains of the original form of the ferromagnesians, but sericite, saussurite and quartz aggregates remain as pseudomorph of original plagioclase (phenocryst). These aggregates are enclosed in a matrix of chlorite, albite, quartz and epidote. A little leucoxene and some coarse chlorite are shown.
1040	No. 54-1 40m	Altered andesitic tuff	The rock consists of dominant carbonates, altered plagioclase laths, aggregates of ore minerals, and minor quartz set in a crypto-crystalline matrix of quartz, sericite, carbonates, and chlorite. Ore minerals rimmed by small quartz crystals, which are also associated with quartz veins, are fairly abundant.
1135	Vueltas del Rio No. 54-1 135m	Calcareous shale	This rock is composed of carbonate, chlorite, quartz, sericite and carbonaceous matter. Calcite is most abundant (rounded and anhedral, less than 0.3 x 0.3 mm), and surrounded by the aggregates of chlorite and quartz. Quartz (anhedral, less than 0.2 x 0.2 mm) - calcite (anhedral, 0.6 x 0.3 mm) vein is observed in the rock, which is about 1 mm in width.
1160	Vueltas del Rio No. 54-1 160m	Calcareous tuff breccia	The rock is made up of many volcanic fragments, the outline of which is still discernible despite high carbonitization and silicification of the matrix. Most of rock fragments are various type of intermediate volcanics such as andesite and dacite. Mafic minerals (both in fragments and matrix) are completely altered to chlorite, and other secondary minerals. Minor amounts of clasts or sedimentary fragments (chert) are also observed.
1215	Vueltas del Rio No. 54-1 215m	Meta-dacite	Phenocrysts of slightly sericitized plagioclase and chips of albitized plagioclase and quartz occur in a fine-grained matrix of quartz, feldspar, chlorite and rutile. Small euhedral grains of opaque minerals are rare, while no mafic minerals are seen.

Sample No.	Location	Rock Name	Microscopic Observation
2043	Vueltas del Rio No. 54-2 43m	Altered dacitic tuff	Phenocrysts of plagioclase and mafic minerals altered completely to carbonates, sericite, and quartz are set in an altered, fine-grained base of feldspar, carbonates, sericite, chlorite, and quartz. In the groundmass base relict trachytic texture composed of oriented tiny feldspar laths are rarely recognized. Aggregates of ore minerals are fairly abundant.
2066	Vueltas del Rio No. 54-2 66m	Meta-porphyrite	The rock shows typical porphiritic texture. Large plagioclase phenocryst forming glomeroporphiritic clusters (subhedral, less than 2.5 x 1.5 mm, completely altered to saussurite, sericite, and carbonate) are associated with hornblende prisms and flakes of biotite in a matrix of saussuritized feldspar, quartz, magnetite and carbonate. Most of hornblendes are also decomposed to chlorite and other secondary minerals, while biotite are fresh. Accessory minerals are apatite, magnetite and ilmenite.
2087	Vueltas del Rio No. 54-2 87m	Meta-porphyry	The rock is holocrystalline-porphyritic, and common alteration products are sericite, chlorite and pyrite. Phenocrysts of plagioclase (subhedral forms, less than 2.0 x 1.4 mm, completely altered to sericite, saussurite, chlorite and calcite) and chlorite and calcite with opaque recrystalized borders after original ferromagnesians are distributed through a rather coarse matrix of plagioclase, hornblende (Z = light greenish brown, X = pale orange) prisms, biotite flakes, and interstitial quartz. Accessory minerals are apatite and magnetite.
2143	Vueltas del Rio No. 54-2 143m	Altered dacitic tuff	The rock consists almost entirely of fine-grained carbonates, quartz, and opaque dusty materials. No primary igneous minerals and textures are observed. Some quartz grains less than 0.5 mm in size are present. Ore minerals rimmed with small quartz crystals are fairly abundantly disseminated.
2170	Vueltas del Rio No. 54-2 170m	Meta-andesite	Saussurite and albite replacing intermediate plagioclase with hornblende, quartz and carbonate are the main constituents of this rock. Needless or prismatic crystals of hornblende (less than 2 x 0.3 mm) surrounded by felsitic matrix are prevailing. There is a little chlorite, magnetite and apatite.

Sample No.	Location	Rock Name	Microscopic Observation
2210	Vueltas del Rio No. 54-2 210m	Meta andesite	This work is strongly altered andesite. Main constituent minerals are chlorite, sericite (acicular, less than 0.2 x 0.02 mm), plagioclase (less than 0.5 x 0.4 mm), calcite and quartz (anhedral, 0.15 x 0.10 mm). Most of plagioclases are completely replaced by calcite, chlorite, sericite and opaque minerals. Sphene is observed as a minor constituent.
3042	Vueltas del Rio No. 54-3 42m	Altered dacitic tuff	Carbonated and sericitized plagioclase (oligoclase?) crystals of 0.1 to 1 mm in size are set in a fine-grained matrix of quartz, feldspar, sericite, and carbonates showing hornfels-like texture. A small amount of mafic minerals (pyroxenes?) is completely altered into an aggregate of carbonates, chlorite, and opaque minerals.
3054	Vueltas del Rio No. 54-3 54m	Calcareous tuff breccia	The rock has many fragments which are embedded in and permeated by carbonate and small amounts of sericite. Some andesitic fragments constitute micro-phenocrysts of andesine laths and chlorite pseudomorph (after hornblende) in a matrix of glass with microlite. Others constitute of coarser equivalents (in a holochrystalline matrix of feldspar lath, quartz, and chlorite).
3086	Vueltas del Rio No. 54-3 86m	Meta dacite	The rock is composed of dominant sericitized feldspar and subordinate carbonated mafic mineral (pyroxene?) phenocrysts of 0.5 to 1 mm in size set in a fine-grained groundmass of carbonates, chlorite, sericite, and quartz. Ore minerals rimmed with small quartz crystals are fairly abundant. Epidote is also present.
3176	Vueltas del Rio No. 54-3 176m	Altered tuff	The rock consists mainly of fine-grained quartz, carbonates, sericite, and chlorite. Some larger carbonate aggregates (0.1-0.5 mm in size) may be relic of mafic minerals. Rare plagioclase relic and epidote are also observed. Disseminated ore minerals associated with quartz crystals are abundant.
3196	Vueltas del Rio No. 54-3 196m	Tuff breccia	Fragments of sericite-quartz rock and chips of quartz, sericite, titan-mineral, rather abundant pyrite? are embedded in and permeated by calcite. Predominant fine aggregates of sericite through the rock may be alteration products from feldspar.

Sample No.	Location	Rock Name	Microscopic Observation
3248	Vueltas del Rio No. 54-3 248m	Meta andesite breccia	The rock is made up of fragments of altered andesitic lava, some glassy, some porphyritic. Portions of matrix (among fragments), are glassy or feldspathic materials, and are partly carbonatized or silicified. Glassy fragments are composed mainly of laths of plagioclase, up to 0.6 mm in size, in a matrix of glass (replaced by chlorite) and lesser amounts of magnetite. Porphyritic fragments are composed of large subhedral plagioclase quartz chlorite filling amygdales in a pilotaxitic matrix of plagioclase lath, chlorite patches, quartz, magnetite and carbonate.
4083	Vueltas del Rio No. 54-4 83m	Tuff breccia	The rock is dark grey, and contains many lighter grey fragments (pumice) ranging from dust size particles to fragments as much as a few centimeters. Under the microscope, boundaries among particles are almost unidentified due to high silicification and carbonitization through the rock. Most of feldspar crystals are replaced by calcite, sericite and a little iron ore. Rounded quartz phenocrysts may be only original minerals remaining in the confused fine aggregates of quartz, albite, sericite and calcite.
4109	Vueltas del Rio No. 54-4 109m	Tuff breccia	The rock were subjected to conspicuous alteration (silicification and carbonitization) which causes the identification of original texture difficult. Subangular to rounded fragments of coarse-grained quartz-($\pm$ sericite) aggregate and sericite patches and carbonate rhombohedron are cemented by finer quartz (cherty materials). Irregular form of opaque minerals among carbonate and quartz assemblages may be pyrite or other iron sulfide.
4160	Vueltas del Rio No. 54-4 160m	Altered tuff	The rock consists almost entirely of fine-grained (less than 0.1 mm in size) carbonates, chlorite, sericite, quartz, and feldspar; no relict igneous minerals and textures are observed. Fine-grained ores (less than 0.5 mm) are occasionally present.

Sample No.	Location	Rock Name	Microscopic Observation
4210	Vueltas del Rio No. 54-4 210m	Meta andesite	Phenocrysts of plagioclase (subhedral, less than 3.1 mm) are completely altered to saussurite or aggregate of sericite and ferromagnesian (euhedral prismatic crystals, less than 2 x 0.4mm, pseudomorph after hornblende?) to chlorite and calcite. Groundmass is also highly altered, and composed of confused aggregates of albite, quartz, chlorite and sericite with accessory iron oxide.
5029	Vueltas del Rio No. 54-5 29m	Meta andesite	Abundant plagioclase and less abundant mafic mineral phenocrysts are set in an altered, fine-grained groundmass composed of carbonates, quartz, sericite, and chlorite. Plagioclase is altered completely to sericite and carbonate, and mafic minerals to carbonate. Apatite is also present. Occasional are minerals are observed.
5036	Vueltas del Rio No. 54-5 36m	Altered dacitic crystal tuff	Completely carbonated, sericitized, and chloritized plagioclase and mafic mineral crystals are set in a fine-grained matrix composed of quartz, sericite, chlorite, and carbonates. Rate quartz fragments of 0.1 - 0.5 mm in size are observed. Apatite of 0.1 to 0.2 mm in diameter is also present.
5062	Vueltas del Rio No. 54-5 62m	Tuff breccia	Igneous rock fragments are separated by streaks of argillaceous or cherty materials and patches of carbonate (a third of the section is occupied by calcite ($\pm$ quartz vein). Rock fragments are mainly composed of large phenocrysts of albite (subhedral, less than 2.0 x 1.2 mm) and quartz (anhedral, less than 0.9 x 0.6 mm), in a rather coarse matrix of feldspar, quartz, sericite, leucoxene and iron ores.
5082	Vueltas del Rio No. 54-5 82m	Meta dacite (breccia)	Rounded quartz phenocryst (less than 1.3 x 0.9 mm) and subhedral crystals (less than 1.3 x 1.2 mm) and chips of plagioclase are embedded in a matrix of aggregate of feldspar, sericite, quartz with accessory iron oxide and leucoxene. Rutile and considerable carbonate are present. The matrix, highly altered and confused, show traces of a fragmental character.

Sample No.	Location	Rock Name	Microscopic Observation
5161	Vueltas del Rio No. 54-5 161m	Meta andesite	This highly altered green rock have fine reddish grey stripes visible (due to the concentration of ferruginous materials?). Under the microscope, lath or plate (saussurrite and muscovite, pseudomorph after plagioclase) and prismatic crystals (chlorite, magnetite, leucoxene and carbonate, pseudomorph after ferro-magnesians?) are recognizable in a matrix of less clearly defined aggregate of sericite, chlorite, carbonate, magnetite and other secondary minerals.
5192	Vueltas del Rio No. 54-5 192m	Calcareous shale	The rock is composed of an aggregates of carbonate, chlorite, quartz, carbonaceous matter and opaque minerals. Calcite vein is observed in the rock, which is about 0.8 mm in width.
5228	Vueltas del Rio No. 54-5 228m	Tuff breccia	Rock fragments and chips of quartz and sericitized and/or carbonatized feldspar are embedded in a matrix of white mica, brownish clay or chlorite, and carbonate. Rock fragments are those of altered intermediate volcanics with lesser amount of chert. Some calcite and chlorite veinlets are seen. Accessory minerals are leucoxene and iron ore.
6063	Vueltas del Rio No. 54-6 63m	Altered dacitic tuff	Completely carbonated plagioclase and mafic mineral crystals less than 1 mm in size are set in a fine-grained matrix of quartz, feldspar, sericite, chlorite, and carbonates. Occasional sphene less than 0.1 mm is also observed.
6138	Vueltas del Rio No. 54-6 138m	Altered tuff breccia	Fragments of quartz crystals and andesites showing relict hyalopilitic texture are set in a fine-grained, intensely altered base of carbonates, sericite, quartz, and chlorite. Mafic minerals (pyroxenes?) are altered completely into carbonates.

Sample No.	Location	Rock Name	Microscopic Observation
6213	Vueltas del Rio No. 54-6 213m	Andesite	The rock shows typical porphiritic texture. Phenocrysts of subhedral andesine (some have carbonatized core) and aggregates of calcite and/or chlorite (that may be completely altered mafic minerals such as olivine) are in a fine-grained matrix of plagioclase lath (albite?), quartz, chlorite, calcite and strings of sericite. Small amounts of euhedral magnetite, irregular form of leucoxene, and ore dust are also seen in the matrix.
6243	Vueltas del Rio No. 54-6 243m	Tuff breccia (lithic tuff)	Fragments of basaltic andesite, glass shard, plagioclase chips are recognizable in a matrix of fine-grained quartz, calcite, sericite and altered glass (?). Most of the fragments are basaltic andesite, containing clusters of (= glomeroporphiritic) plagioclase and a little ferromagnesian (altered to chlorite, calcite, quartz and iron ore) in a glassy matrix. Abundant vesicules filled with quartz, chlorite, sericite and hematite are also observed in some fragments.
7165	Vueltas del Rio No. 54-7 165m	Altered tuff	The constituent minerals are almost completely altered into carbonates, sericite, chlorite, and quartz. Rare elongated pseudomorphs after plagioclase are observed. Cubic ore minerals less than 1 mm in size are abundant.
7173	Vueltas del Rio No. 54-7 173m	Meta tuff breccia	Completely carbonated phenocrysts (plagioclase and mafic minerals) are set in a very fine-grained matrix of quartz, sericite, and chlorite. Ore minerals and titanomagnetite or ilmenite are fairly abundant.
7192	Vueltas del Rio No. 54-7 192m	Tuffaceous shale	This rock is made up of silty and argillaceous layers, in which the chief minerals are quartz, white mica, carbonate, and a little chlorite. Some layers are delineated by carbonate, and stipped with abundant euhedral pyrite? crystals. A little sphene is also seen.
7220	Vueltas del Rio No. 54-7 220m	Altered rhyolitic tuff	Broken crystals of sericitized feldspar, resolved quartz, and rare carbonated mafic minerals are set in a fine-grained base composed of dominant quartz, subordinate feldspar, sericite, carbonates, and chlorite. Aggregates of fine-grained cubic ore minerals associated with quartz are abundant.

Sample No.	Location	Rock Name	Microscopic Observation
7242	Vueltas del Rio No. 54-7 242m	Meta dacite	The main constituent minerals are felsic mineral and quartz. The rock is traversed by some veinlets of calcite. Phenocrysts of rounded quartz and subhedral plagioclase (highly saussuritized) are in a matrix of quartz, feldspar, chlorite, calcite and sericite. Rims of sodic feldspar around quartz are common. Aggregates of chlorite, calcite, and magnetite (pseudomorph after hornblende?) are rarely observed. The rock is traversed by some veinlets of carbonate.
7279	Vueltas del Rio No. 54-7 279m	Meta dacite	Phenocrysts of sericitized plagioclase (subhedral, less than 1 x 2 mm), rounded quartz, and large prisms (pseudomorph after hornblende, aggregate of secondary chlorite and calcite, locally stained with ferruginous material, and rimmed by minor dusts of magnetite) lie in a matrix of quartz, feldspar and secondary chlorite and calcite. Plates or laths of plagioclase are poikilitically enclosed in some (hornblende) prisms. Considerable amounts of apatite (or topaz?) are present.
8180	Vueltas del Rio No. 54-8 180m	Meta quartz latite	Phenocrysts of quartz (rounded and corroded grains, less than 1.2 x 1.2 mm) and sericitized and carbonatized feldspars (less than 1.4 x 0.7 mm) occur in a matrix of fine-grained quartz, albite and sericite. Abundant pyrite (euhedral to subhedral, up to 0.4 x 0.3 mm) are disseminated through the rock. Accessory minerals are rutile and leucoxene.
8221	Vueltas del Rio No. 54-8 221m	Altered rhyolitic tuff	The rock is composed mainly of fine-grained crystals (less than 0.05 mm in size) of quartz, carbonate, sericite, and chlorite. Broken crystals of quartz less than 1 mm are occasionally present. Ores are rate.
8242	Vueltas del Rio No. 54-8 242m	Meta dacite	Completely carbonated phenocrysts (plagioclase and mafic minerals) of 0.1 to 0.5 mm in size are set in a fine-grained matrix composed of abundant quartz, minor sericite, chlorite, and carbonates. Ore minerals are rare.

A. I—2 Microscopic Observations (Polished Sections)

Sample No.	Location			Ore Mineral	Microscopic Observation
	X	Y	No. of Sketch Map		
S031	300 + 33.66	1600 + 82.28	PL.I-3-2 (Nelson Trench)	Native gold	It is composed largely of the secondary iron hydro-oxide minerals with a small amount of gold. They show colloform bands in cracks and cavities. Two phases are observed in colour in the colloform bands. One is greyish white and shows spherolitic aggregates and a distinct anisotropy. The other is light grey and shows the cryptocrystalline and does not show the anisotropy. Both are anhedral goethite. A small amount of gold occurs in the gangue minerals. The shapes of gold crystals are irregular and/or rounded. They are golden yellow and are 20 to 5 μ across. They are native gold rather than electrum in the color.
S035	33.13	82.40	PL.I-3-1 (San Martin Adit)	Fe ore	Ore minerals in this sample are all secondary products, which show a colloform texture and form veinlets in cracks and cavities. They are light grey and show a distinct anisotropy and internal reflections of reddish brown. They are goethite. The crystals in the cavity show spherolitic aggregates and a zonal texture. It is observed partly to be goethite pseudomorphs after pyrite. A small amount of hematite is seen to be idiomorphic needle like crystals. And then, a few small crystal like a native gold or electrum is seen in the gangue minerals. But they

Sample No.	Location			Ore Mineral	Microscopic Observation
	X	Y	No. of Sketch Map		
					couldn't be identified as a gold because of the very small size.
TM7	33.12	82.40	PL.I-3-1 (San Martin Adit)	Fe ore	Megascopically, it is composed largely of white secondary minerals with limonite veinlets forming a network structure, Colloform bands of goethite are observed in cracks and cavities under the microscope. A small amount of goethite pseudomorphs after pyrite occurs also in less abundance. On the other hand, white secondary minerals is dark grey under the microscope and show the characteristic internal reflections of white.
TM13	33.34	82.46	PL.I-3-1 (San Martin Adit)	Fe ore	It is composed largely of the secondary iron-hydro-oxide minerals with a small amount of pyrite. They show colloform bands and spherolitic aggregates with a zonal structure in cavities and cracks. A few pseudomorphs after pyrite is seen in the center of the zonal structure. They are anhedral crystals of goethite.
TM45	33.20	81.84	PL.I-3-3	Fe ore	In this sample primary ore minerals are not found. It is composed mainly of secondary iron minerals, which forming veinlets and network structure replace the gangue minerals. They have two phases in color and are observed in cracks and cavities with colloform bands. One phase is greish

Sample No.	Location			Ore Mineral	Microscopic Observation
	X	Y	No. of Sketch Map		
					white with a blueish tint and shows a distinct anisotropy. It situates an inner part of the colloform texture and also shows spherolitic aggregates. The other is light grey and shows internal reflections of reddish brown and/or brownish yellow. It situates an outer part of the texture. It is seemed to be a product of the later stage. It appear that they are all goethite.

Sample No.	Location	Ore Mineral	Microscopic Observation
4189	DDH. No. 54-4 Depth 189m	Chalcopyrite in Meta tuff	Chalcopyrite is the most abundant sulfide mineral in the rock. It forms disseminated grains measuring 0.1 to 0.5 millimeters across and also occurs in hair-line thick veinlets. Pyrite is relatively sparse and occurs in disseminated grains. A trace of sphalerite in sometimes associated with chalcopyrite.
7173	DDH. No. 54-7 Depth 173m	Sphalerite in meta tuff breccia	Pyrite is the most abundant in the rock and shows disseminated grains ranging from 0.05 to 5 millimeters in size. Galena and sphalerite are sometimes associated with pyrite in appreciable amounts and fills some interstices of pyrite crystals. Sphalerite contains minute inclusions of chalcopyrite and galena. A small amount of disseminated rutile is ubiquitously observed in the rock.
8241	DDH. No. 54-8 Depth 241m	Chalcopyrite in meta tuff breccia	The opaque minerals present are pyrite and chalcopyrite. Pyrite shows a euhedral crystal measuring 0.1 to 1.0 millimeters across. It forms major veinlets in the rock and rarely disseminated grains. Chalcopyrite fills some interstices among the pyrite crystals and replaces some pyrite. It also forms hair-line thin veinlets and is sparsely disseminated in the rock.

Sample No.	Location	Ore Mineral	Microscopic Observation
1248	DDH. No. 54-1 Depth 248m	Chalcopyrite in Meta tuff	Chalcopyrite is the most abundant sulfide mineral. It forms a most part of hair-line thin veinlets in the rock and is also disseminated in the wall rock. Pyrite is a subordinate sulfide mineral and occurs in the chalcopyrite rich veinlets. Pyrite is partly replaced by chalcopyrite. Sphene is sparsely disseminated in the rock.
3176	DDH. No. 54-3 Depth 176m	Chalcopyrite in Altered tuff	Opaque minerals are rarely observed in the rock, and only a few minute grains of chalcopyrite is present. Rutile also occurs in sparsely disseminated grain.
4109	DDH. No. 54-4 Depth 109m	Pyrite and chalcopyrite in tuff breccia	Predominant sulfide minerals are pyrite and chalcopyrite. Pyrite forms disseminated grains measuring 0.05 to 4 millimeters in size. Chalcopyrite is the most abundant sulfide mineral and fills some interstices among pyrite crystals. A trace of galena is rarely observed. Sphene is also present in a small amount.

A. I—3 Photomicrographs of Rocks and Ores

Abbreviation

Minerals

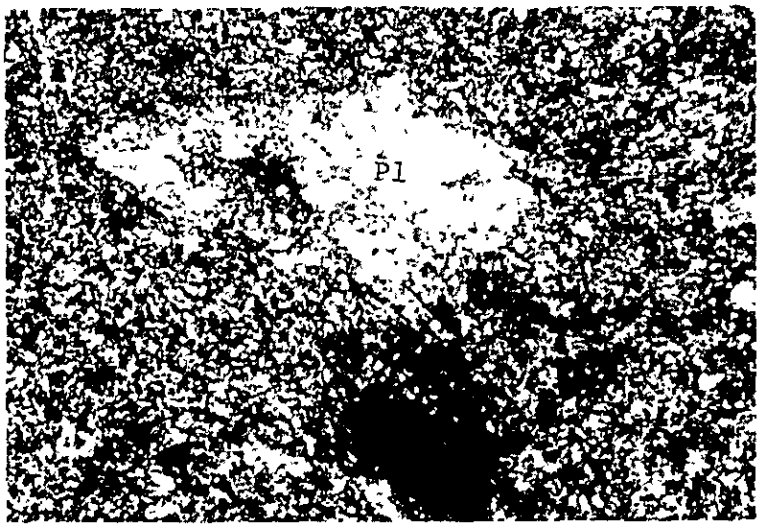
Au : Native Gold
Goe: Goethite
Q : Quartz
F : Feldspar
PI : Plagioclase
Mv : Muscovite
Hb : Hornblende
Cc : Calcite

Others

rf : rock fragment
or : ore minerals (mainly pyrite)
G : gangue minerals

Thin Sections

Sample No.: S032

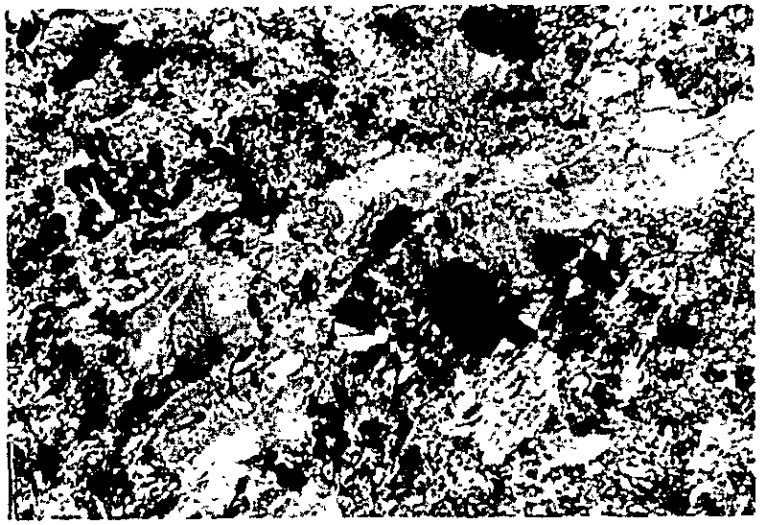


Rock Name : Highly altered andesite

Crossed Nicols

0.5 mm

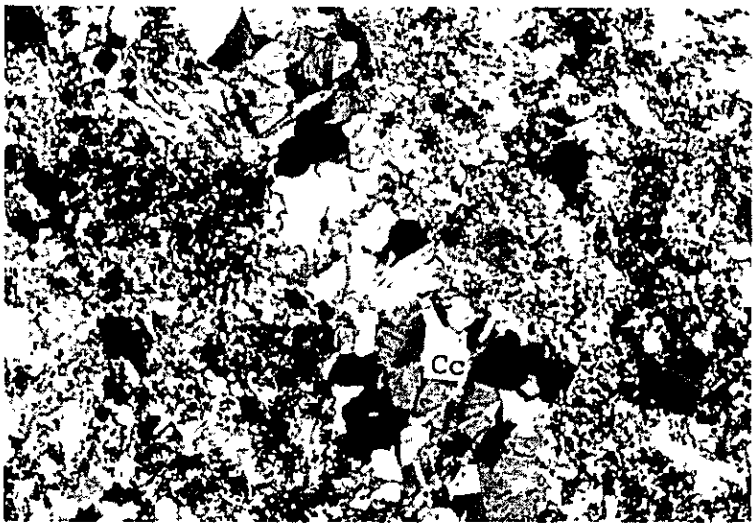
Sample No.: 1040



Rock Name : Altered andesitic tuff

Crossed Nicols

0.5 mm

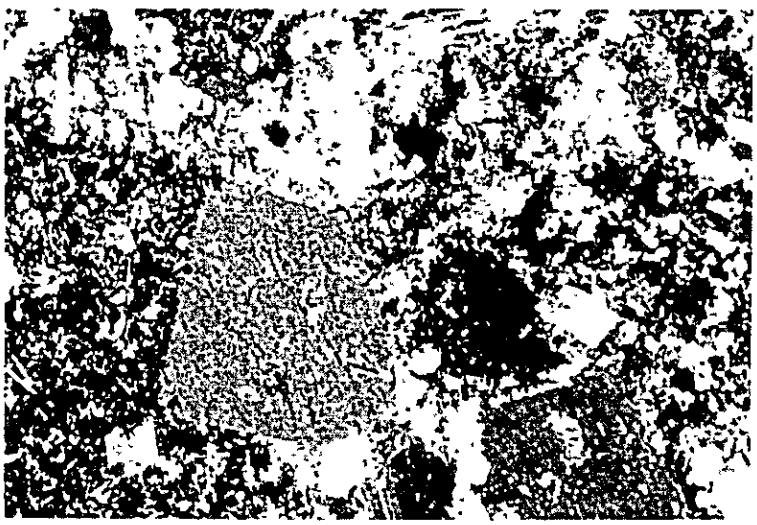


Sample No.: 1135

Rock Name : Calcareous shale

Crossed Nicols

0.5 mm



Sample No.: 1160

Rock Name : Calcareous tuff breccia

Crossed Nicols

0.5 mm

Sample No.: 1215

Rock Name : Meta decite

Crossed Nicols

0.5 mm

Sample No.: 2043

Rock Name : Altered dacitic tuff

Crossed Nicols

0.5 mm

Sample No.: 2066

Rock Name : Meta-porphyry

Open Nicol

0.5 mm

Sample No.: 2087

Rock Name : Meta-porphyry

Crossed Nicols

0.5 mm

Sample No.: 2143

Rock Name : Altered decitic tuff

Crossed Nicols

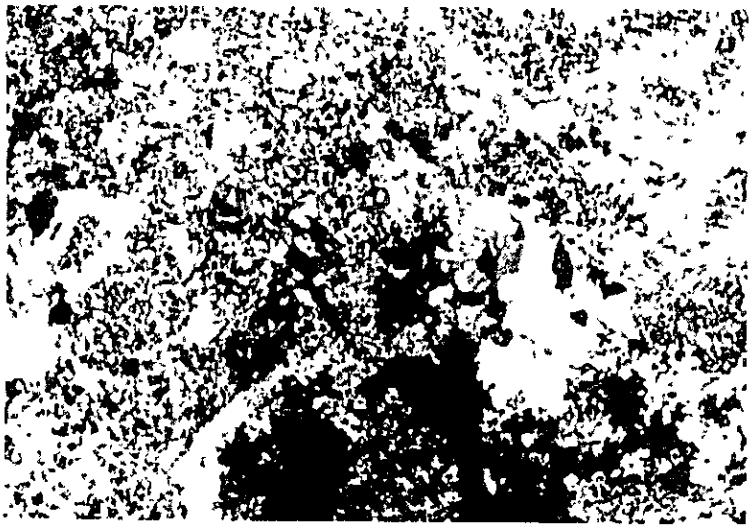
0.5 mm

Sample No.: 2170

Rock Name : Meta-porphyry

Crossed Nicols

0.5 mm

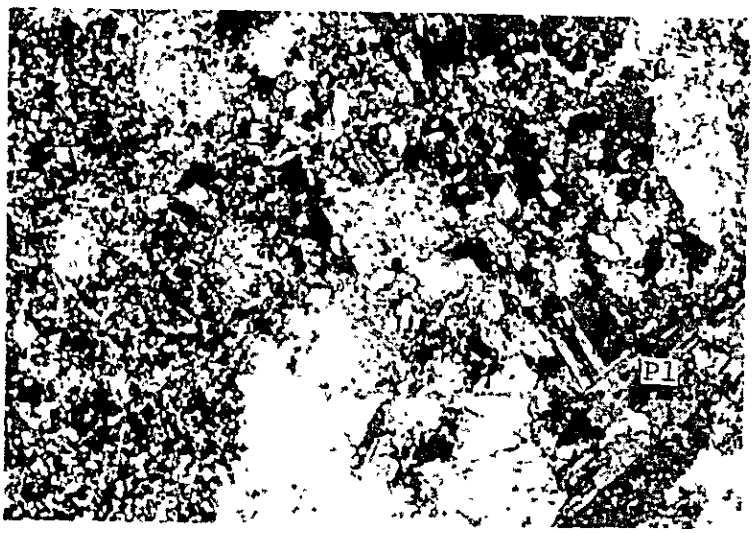


Sample No.: 2210

Rock Name : Meta-andesite

Crossed Nicols

0.5 mm



Sample No.: 3042

Rock Name : Altered dacitic tuff

Crossed Nicols

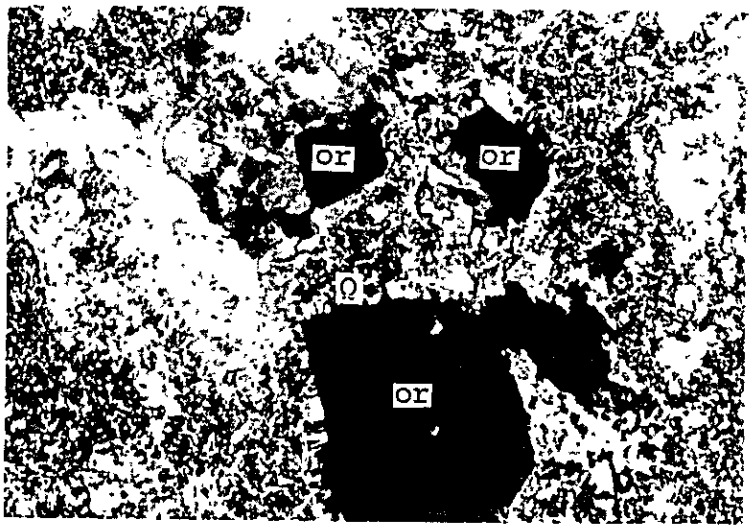
0.5 mm

Sample No.: 3054

Rock Name : Calcareous tuff breccia

Crossed Nicols

0.5 mm



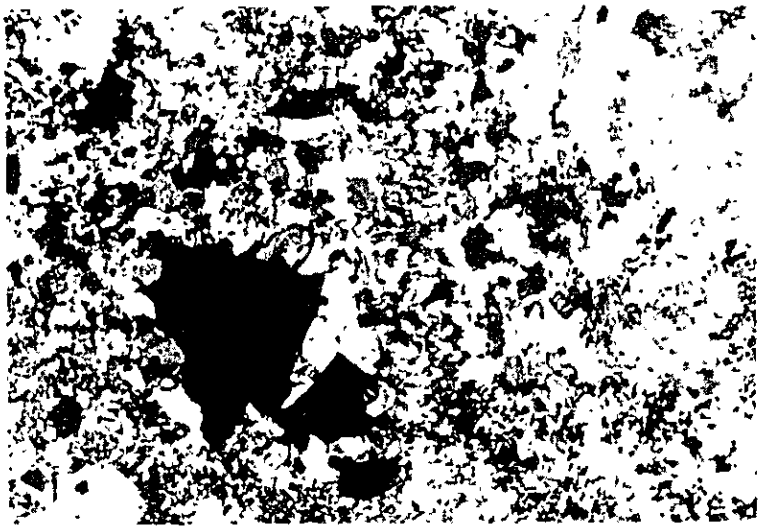
Sample No.: 3086

Rock Name : Meta-dacite

Crossed Nicols

0.5 mm

Sample No.: 3176



Rock Name : Altered tuff

Crossed Nicols

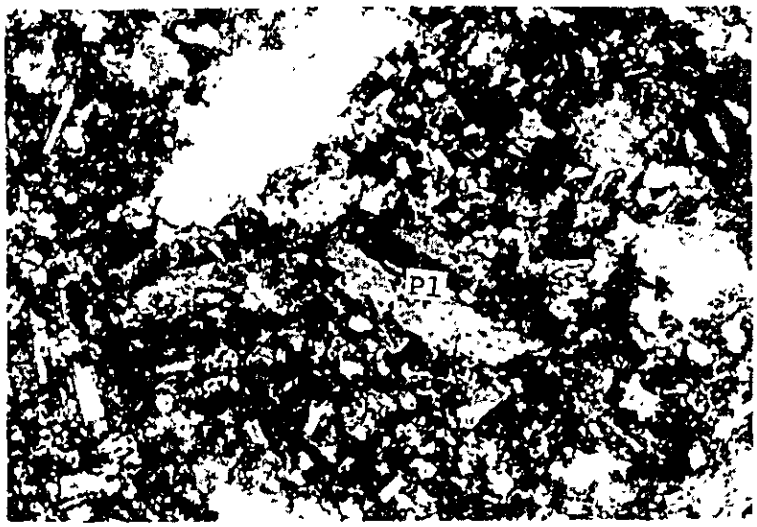
0.5 mm

Sample No.: 3196

Rock Name : Tuff breccia

Crossed Nicols

0.5 mm

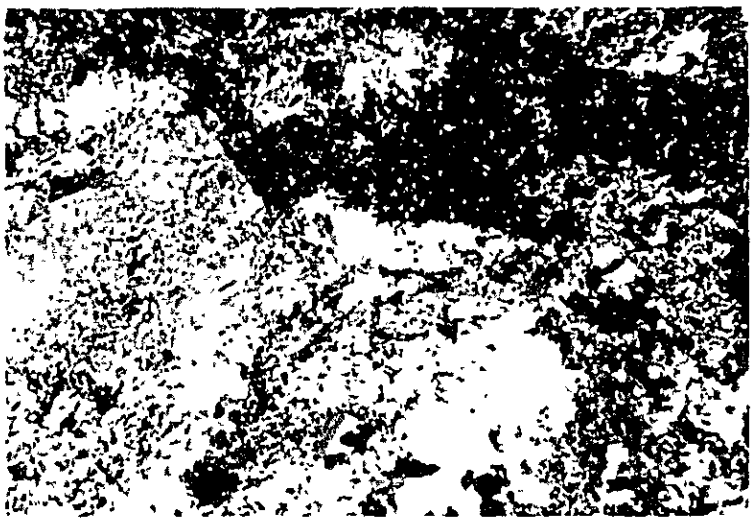


Sample No.: 3248

Rock Name : Meta-andesite breccia

Crossed Nicols

0.5 mm



Sample No.: 4083

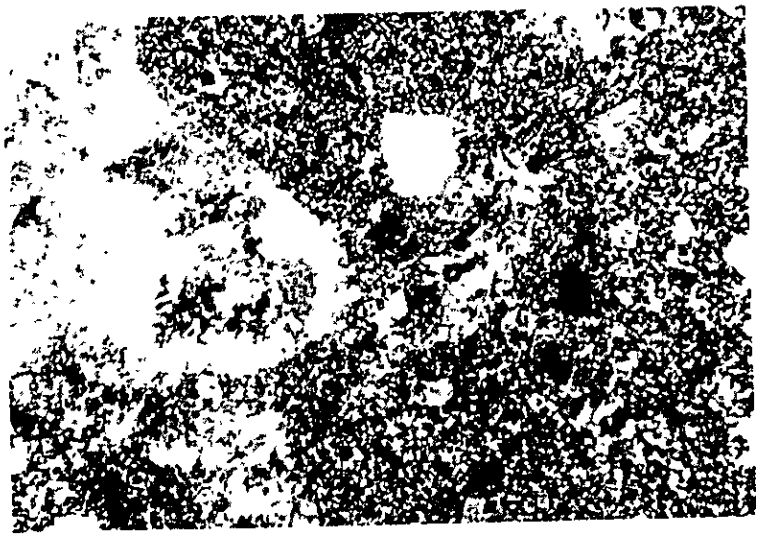
Rock Name : Tuff breccia

Crossed Nicols

0.5 mm

Sample No.: 4109

Rock Name : Tuff breccia

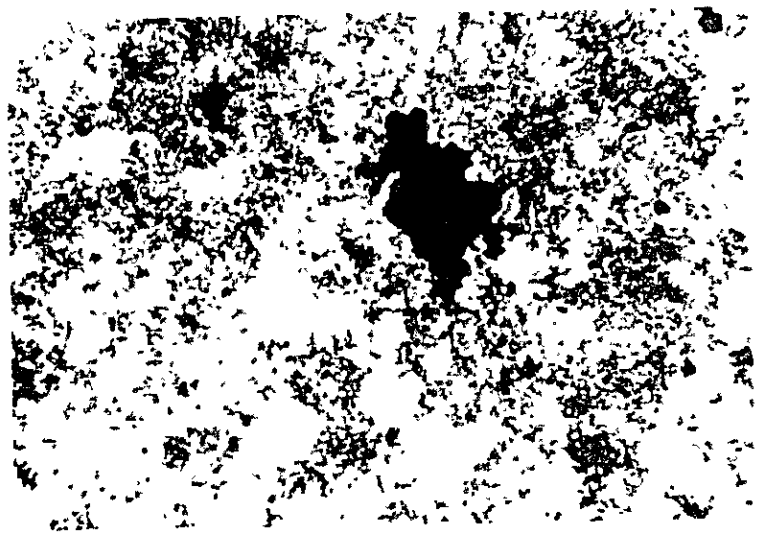


Crossed Nicols

0.5 mm

Sample No.: 4160

Rock Name : Altered tuff



Crossed Nicols

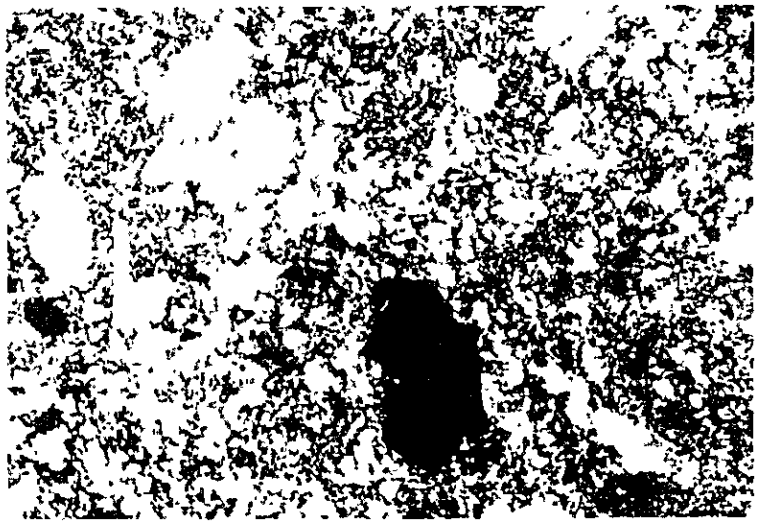
0.5 mm

Sample No.: 4210

Rock Name : Meta-andesite

Crossed Nicols

0.5 mm

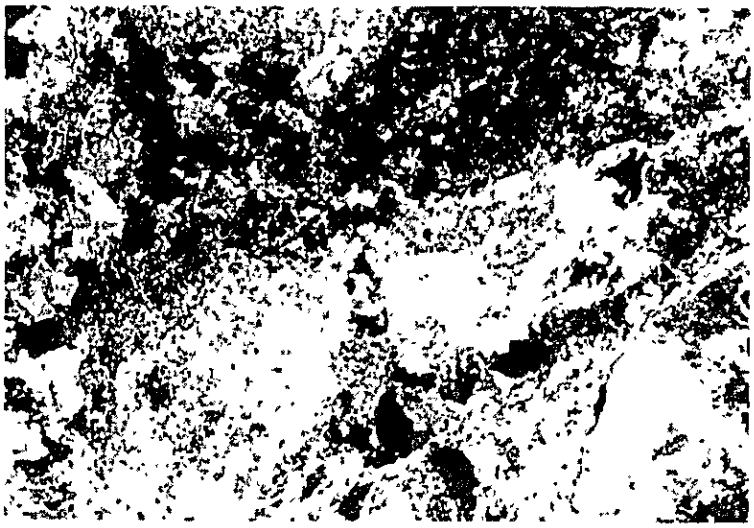


Sample No.: 5029

Rock Name : Meta-andesite

Crossed Nicols

0.5 mm



Sample No.: 5036

Rock Name : Altered dacitic crystal tuff

Crossed Nicols

0.5 mm

Sample No.: 5062

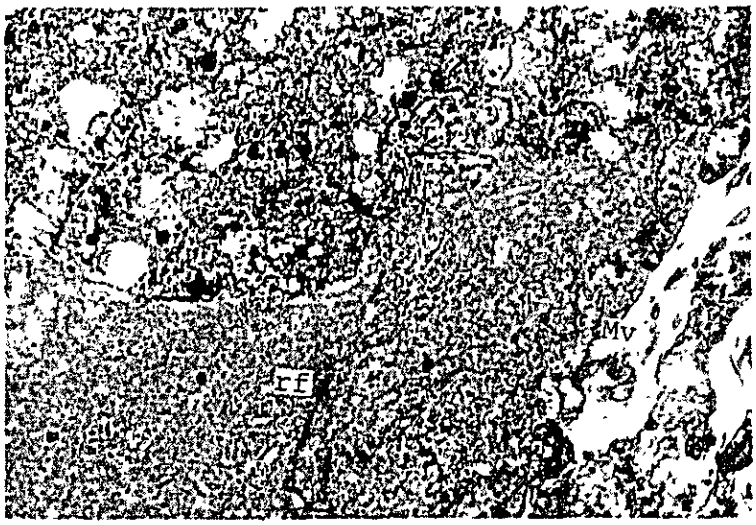
Rock Name : Tuff breccia

Crossed Nicols

0.5 mm

Sample No.: 5228

Rock Name : Tuff breccia

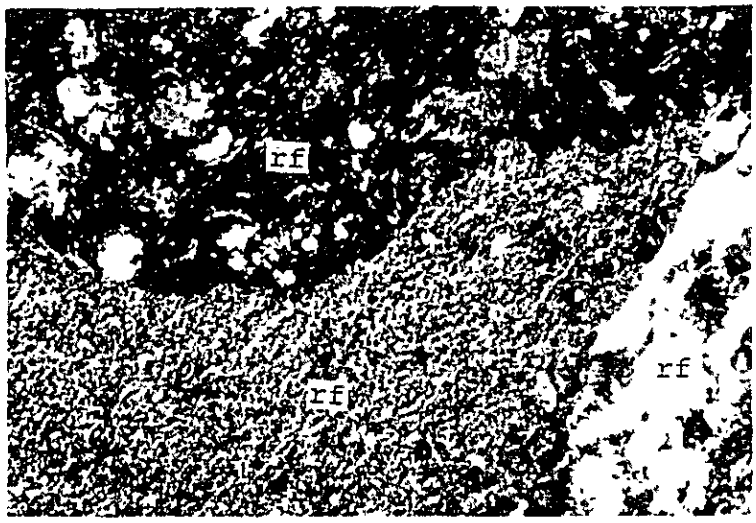


Open Nicol

0.5 mm

Sample No.: 5228

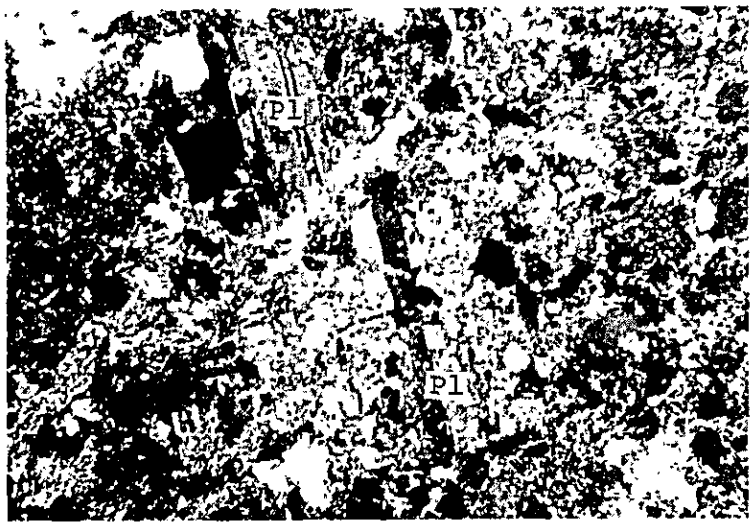
Rock Name : Tuff breccia



Crossed Nicols

0.5 mm

Sample No.: 5082

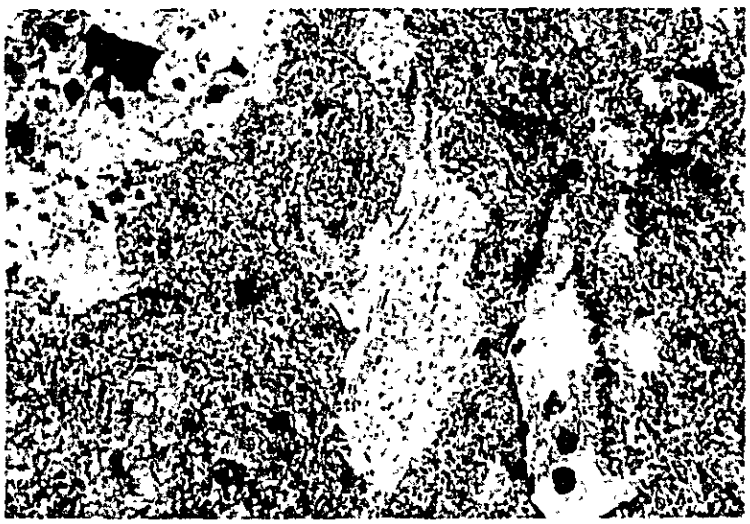


Rock Name : Meta-dacite
(breccia)

Crossed Nicols

0.5 mm

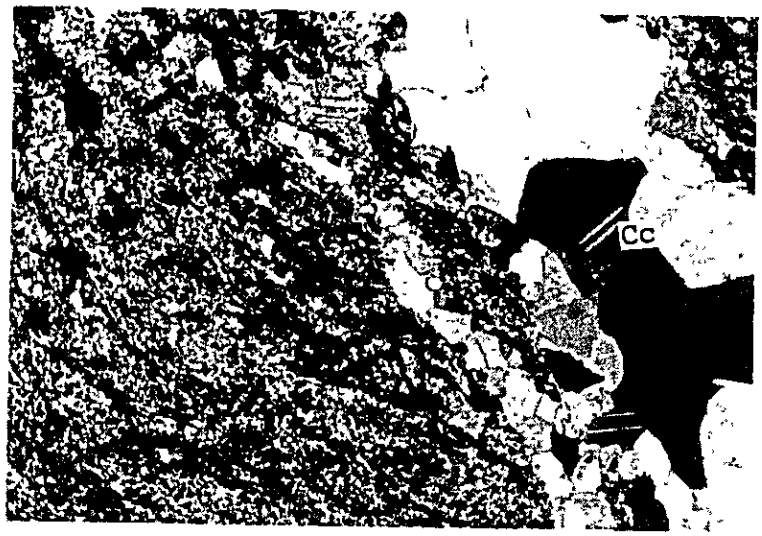
Sample No.: 5161



Rock Name : Meta-andesite

Open Nicol

0.5 mm

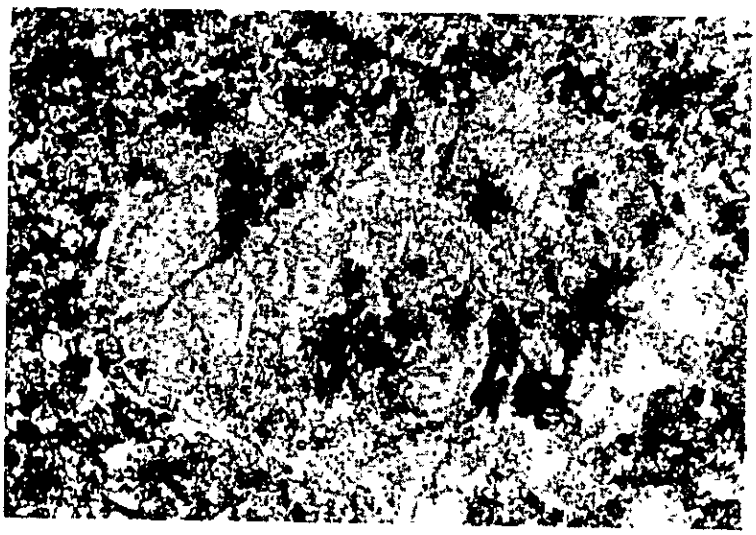


Sample No.: 5192

Rock Name : Calcareous shale

Crossed Nicols

0.5 mm

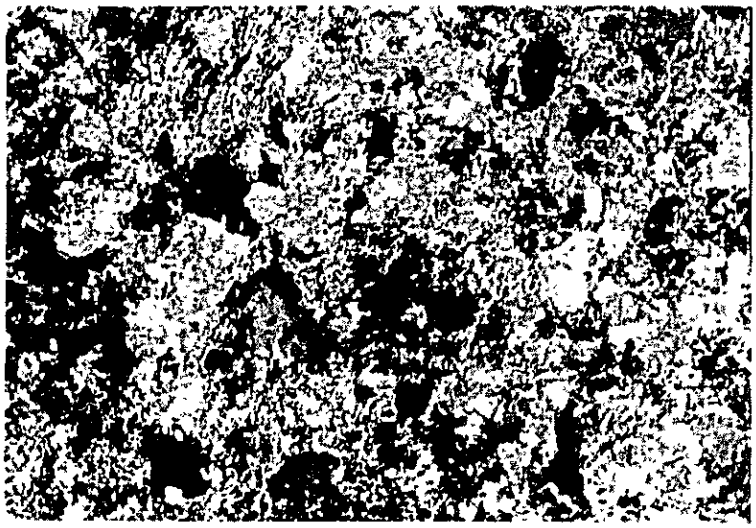


Sample No.: 6063

Rock Name : Altered dacitic tuff

Crossed Nicols

0.5 mm



Sample No.: 6138

Rock Name : Altered tuff breccia

Crossed Nicols

0.5 mm

Sample No.: 6213

Rock Name : Andesite

Crossed Nicols

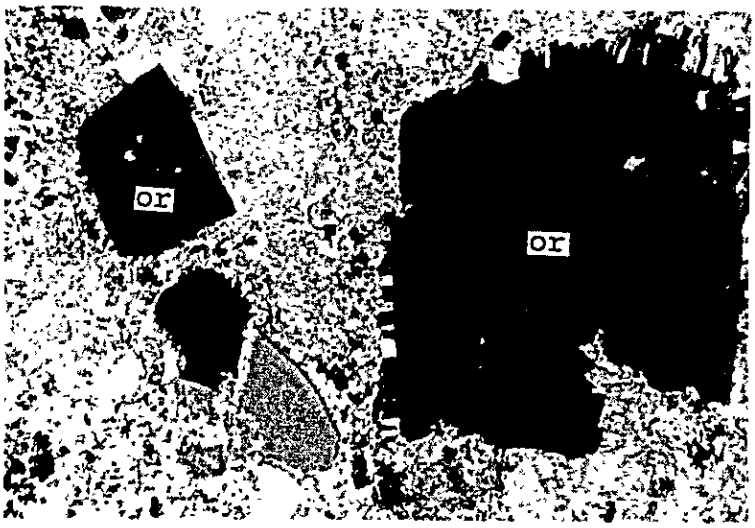
0.5 mm

Sample No.: 6243

Rock Name : Tuff breccia
(Lithic tuff)

Open Nicol

0.5 mm

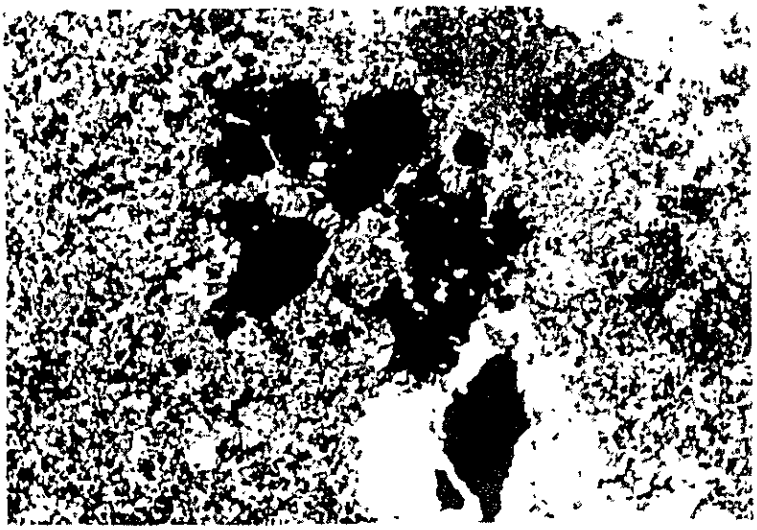


Sample No.: 7165

Rock Name : Altered tuff

Crossed Nicols

0.5 mm



Sample No.: 7173

Rock Name : Meta andesite

Crossed Nicols

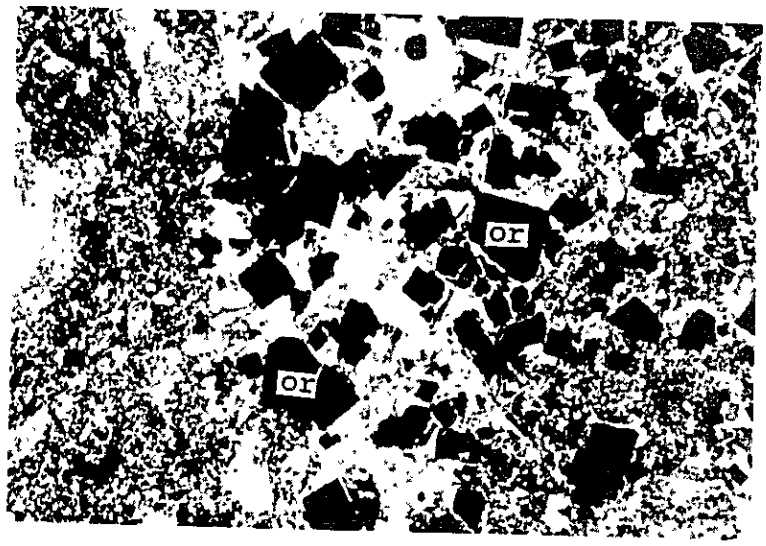
0.5 mm

Sample No.: 7192

Rock Name : Tuffaceous shale

Crossed Nicols

0.5 mm



Sample No.: 7220

Rock Name : Altered rhyolitic tuff

Crossed Nicols

0.5 mm

Sample No.: 7242

Rock Name : Meta-decite

Crossed Nicols

0.5 mm

Sample No.: 7279

Rock Name : Meta decite

Crossed Nicols

0.5 mm

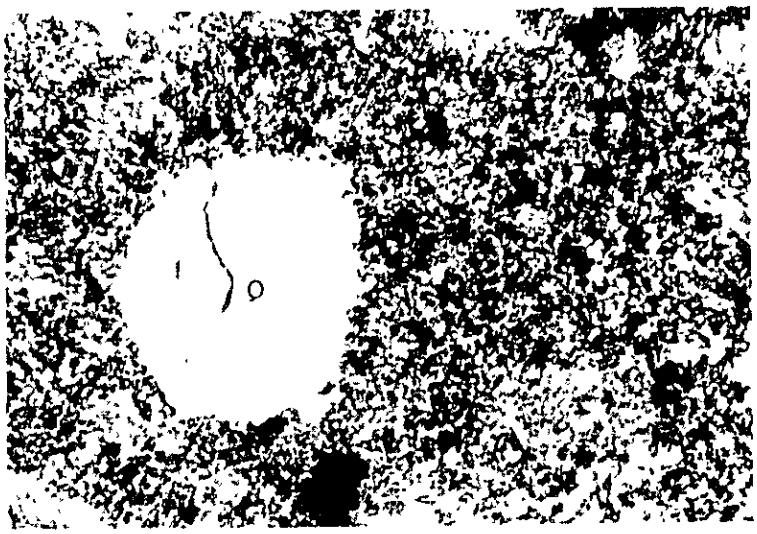
Sample No.: 8180

Rock Name : Meta-quartz latite

Crossed Nicols

0.5 mm

Sample No.: 8221

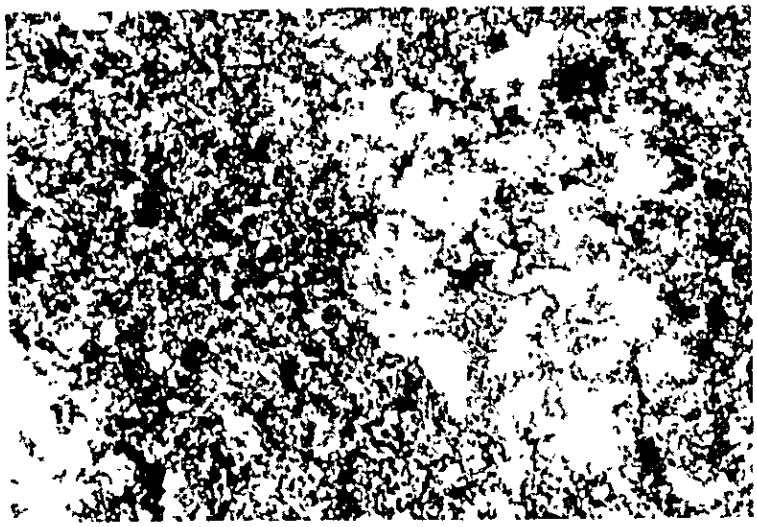


Rock Name : Altered rhyolitic tuff

Crossed Nicols

0.5 mm

Sample No.: 8242

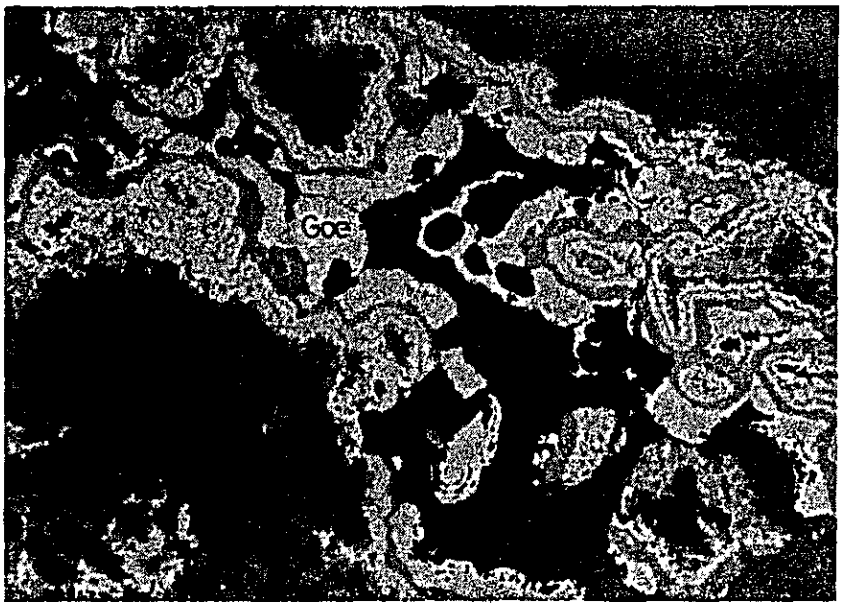


Rock Name : Meta-dacite

Crossed Nicols

0.5 mm

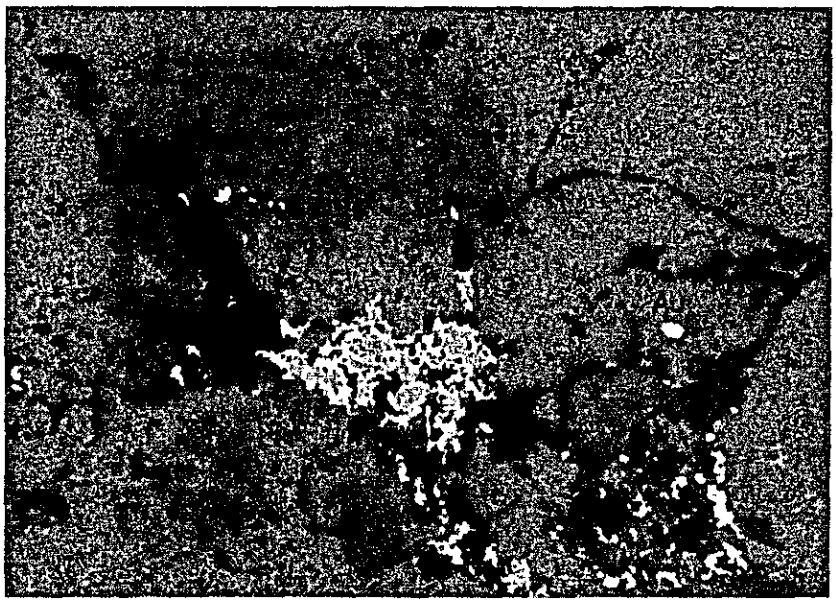
Polished Sections



0 0.2mm

Sample No.: S031

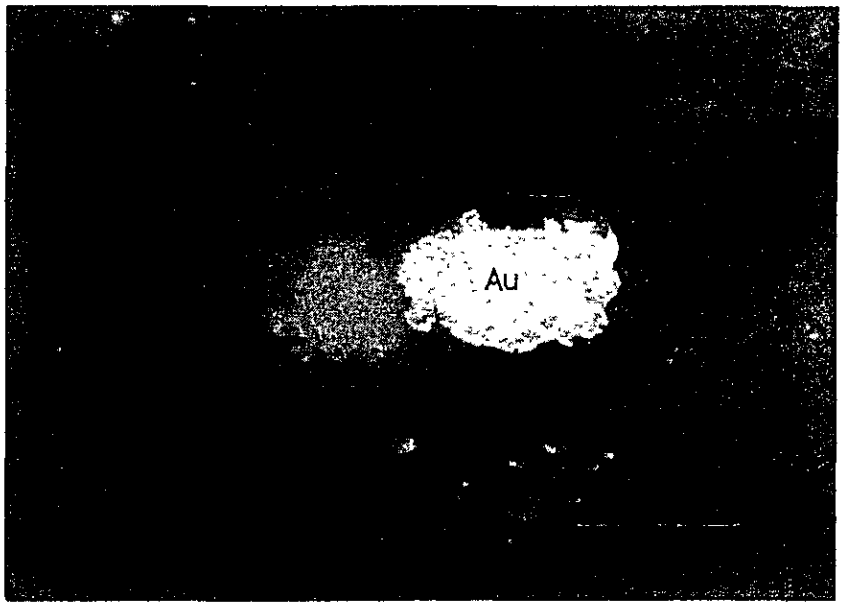
Ore Mineral:
Goethite



0 0.2mm

Sample No.: S031

Ore Mineral:
Native Gold



Sample No.: S031

Ore Mineral:
Native Gold

One Nicol

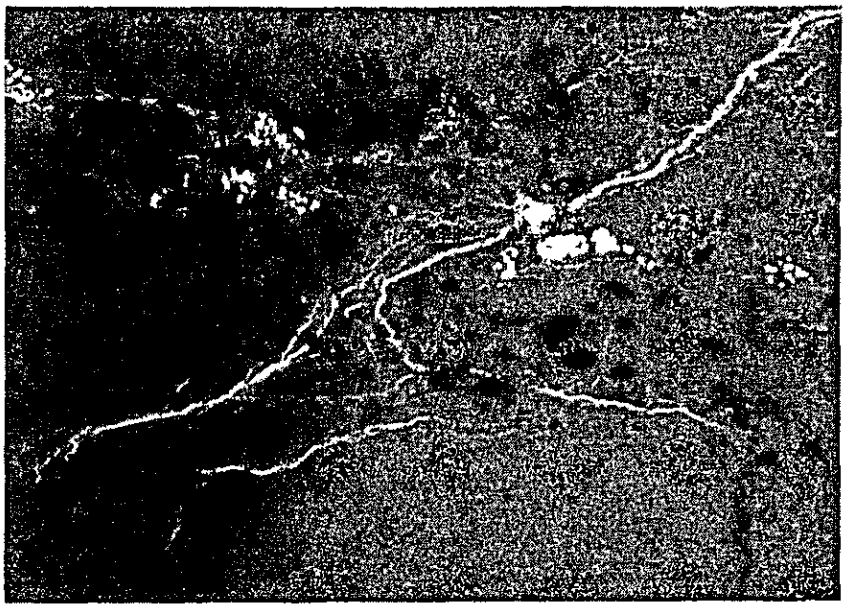
0 0.02mm

Sample No.: S031

Ore Mineral:
Native Gold

One Nicol

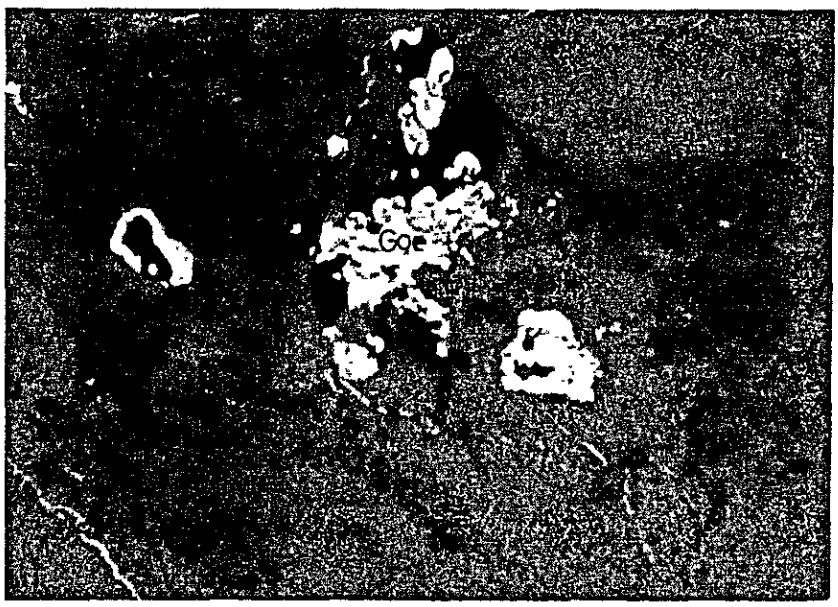
0 0.02mm



Sample No.: S035

Ore Mineral:
Goethite

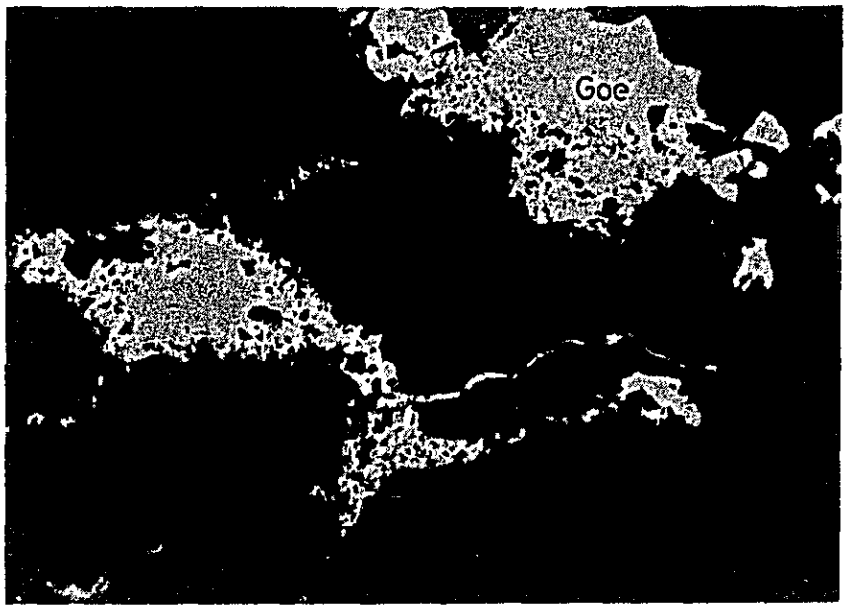
0 0.2mm



Sample No.: S035

Ore Mineral:
Goethite

0 0.2mm



Sample No.: TM7

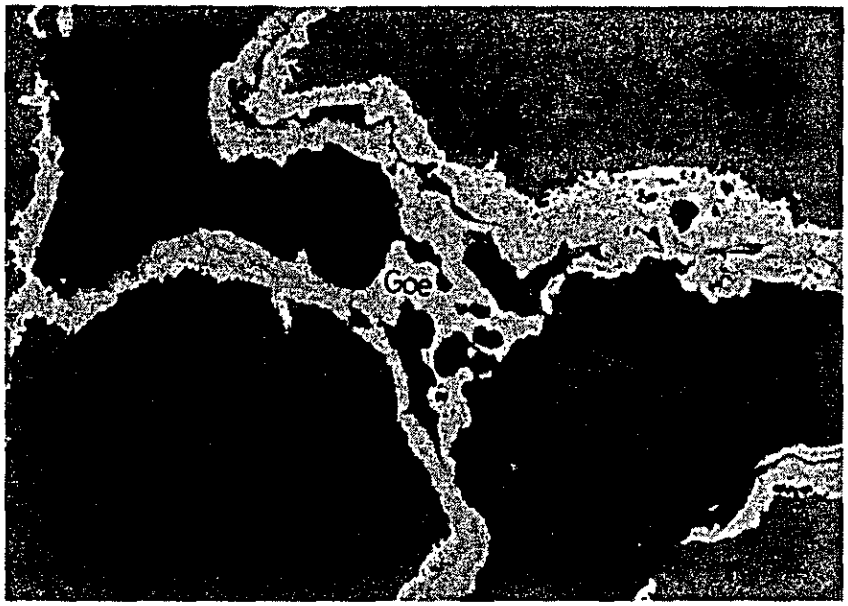
Ore Mineral:
Goethite

0 0.2mm

Sample No.: TM7

One Mineral:
Goethite

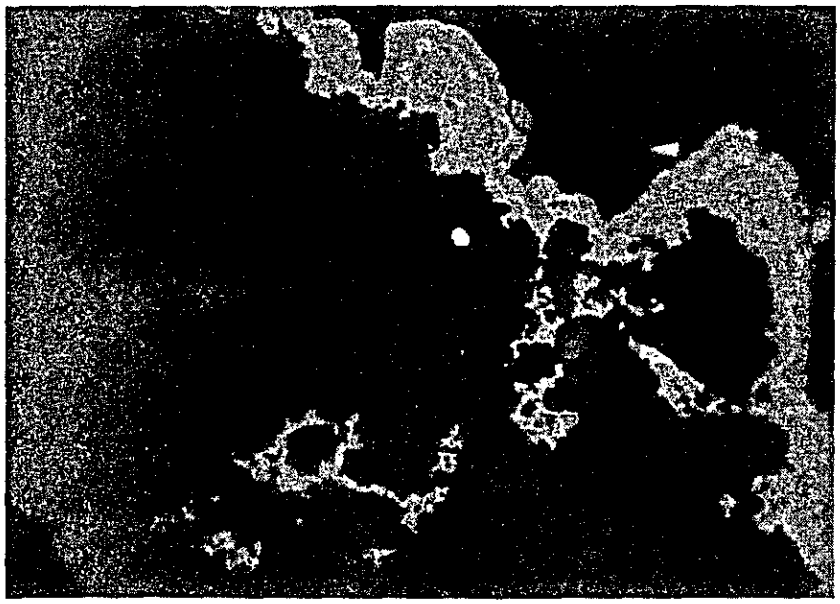
0 0.2mm



0 0.2mm

Sample No.: TM13

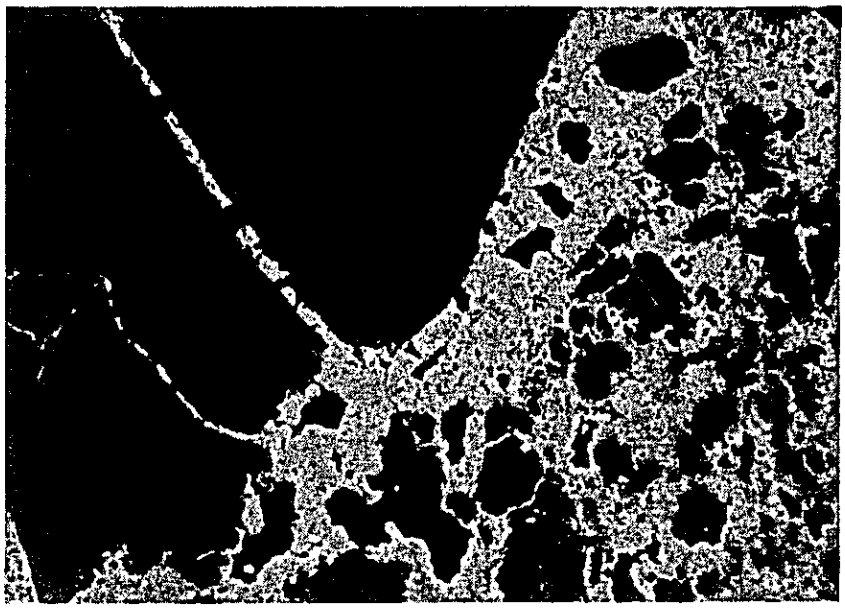
Ore Mineral:
Goethite



0 0.05mm

Sample No.: TM13

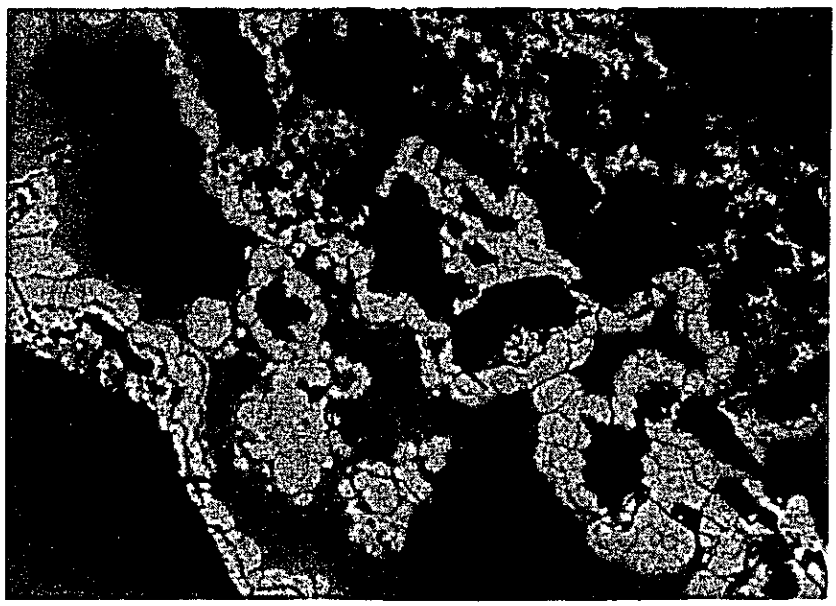
Ore Mineral:
Pyrite



Sample No.: TM45

Ore Mineral:
Goethite

0 0.2mm



Sample No.: TM45

Ore Mineral:
Goethite

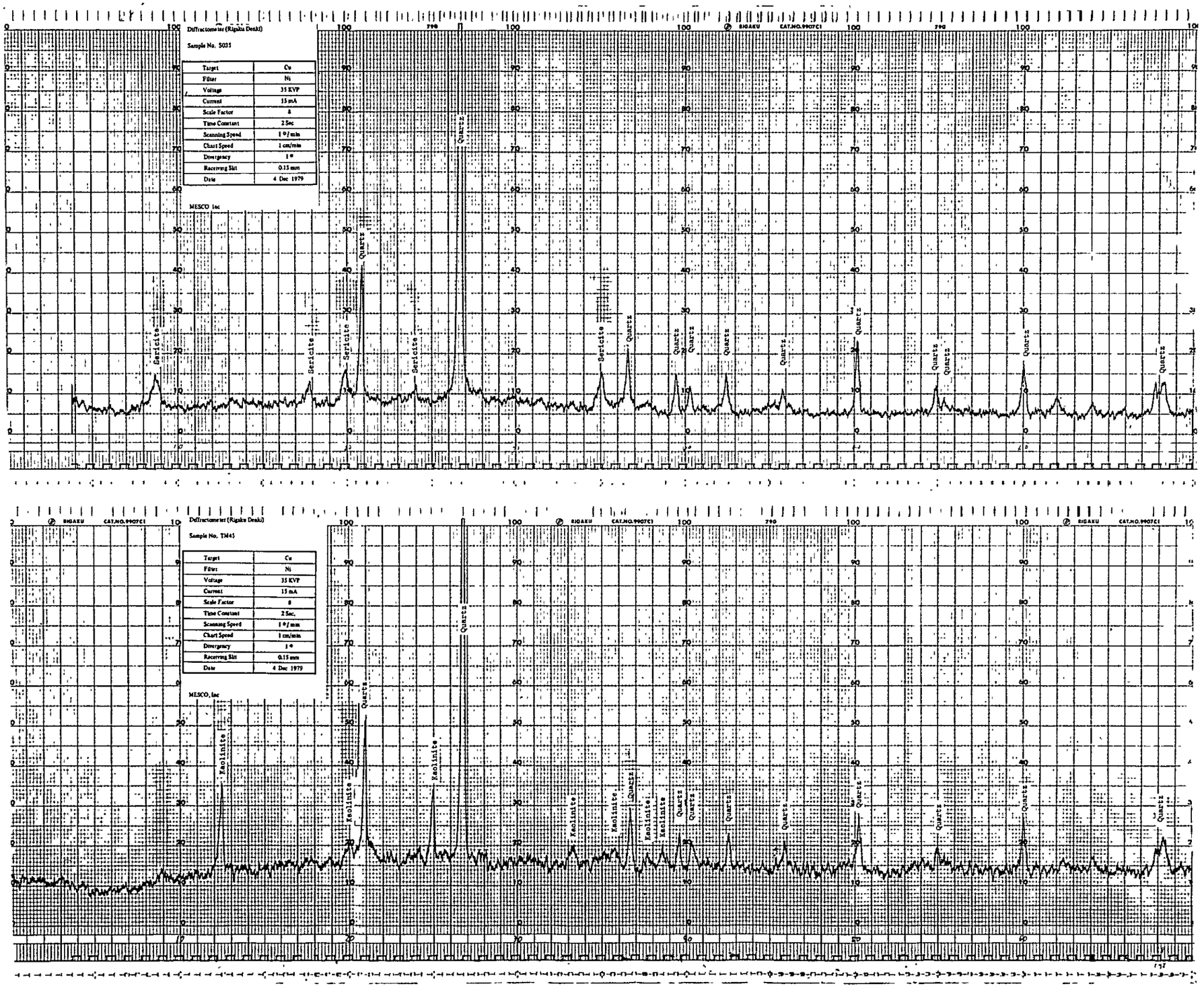
0 0.2mm

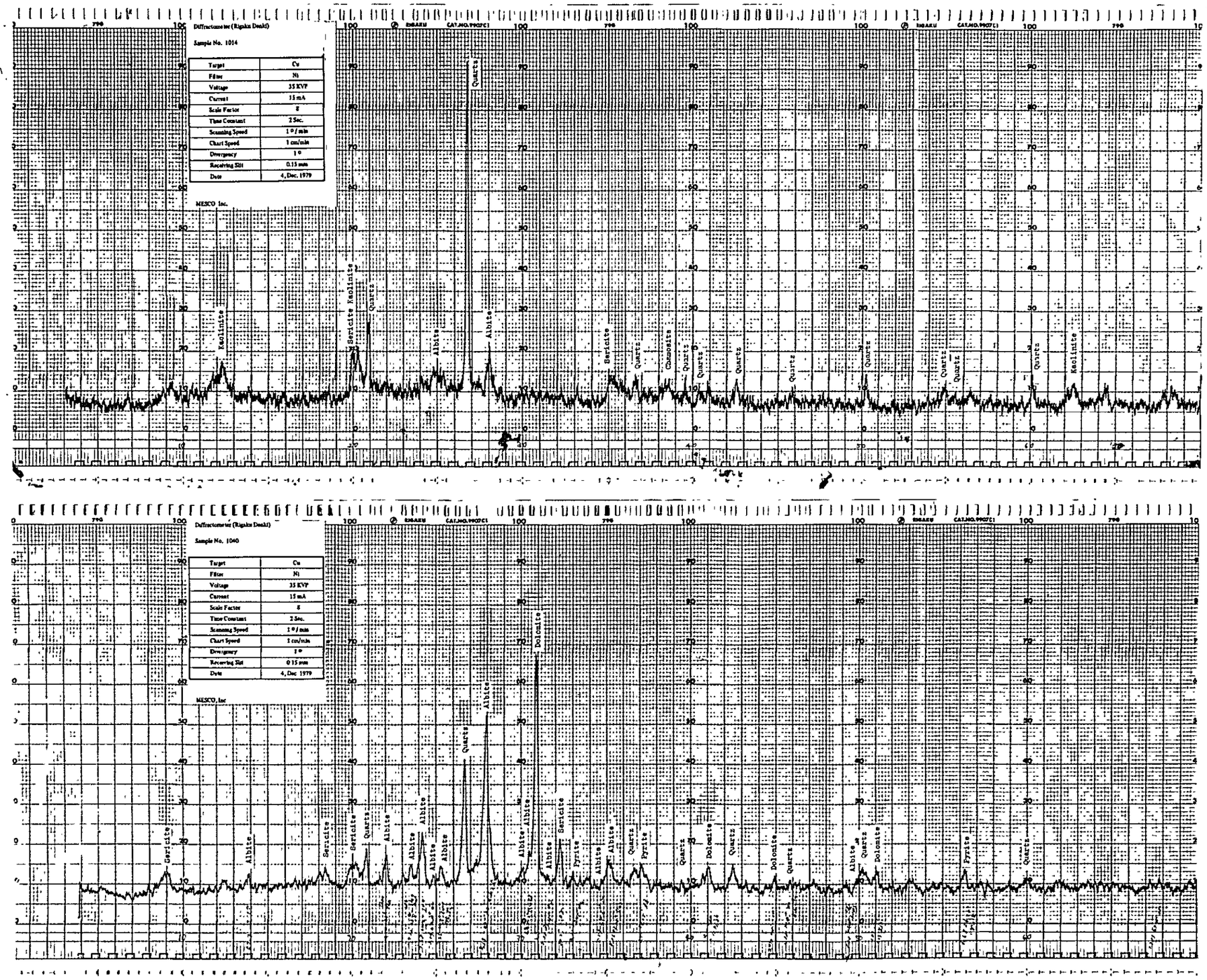
◎ very abundant　　△ Rare
◎ Abundant　　X very rare
○ common

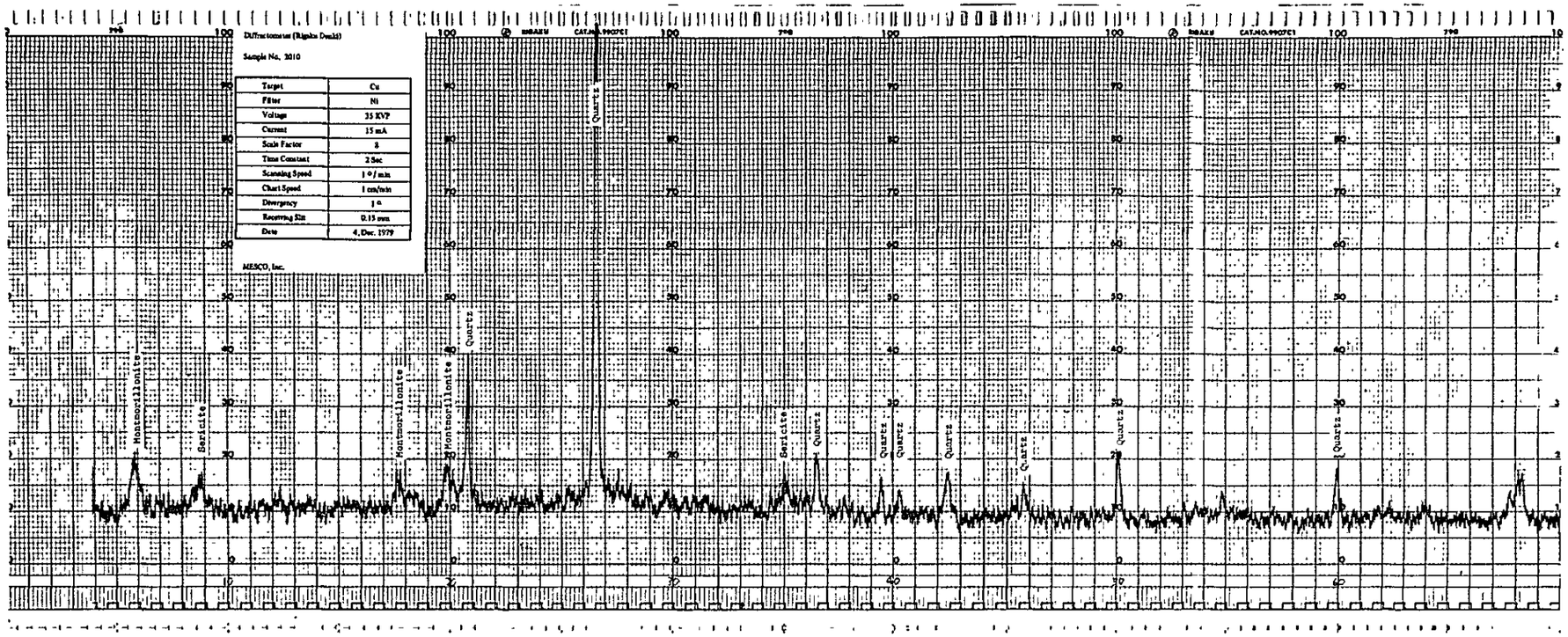
A. I—4 Results of X-ray Diffraction Test

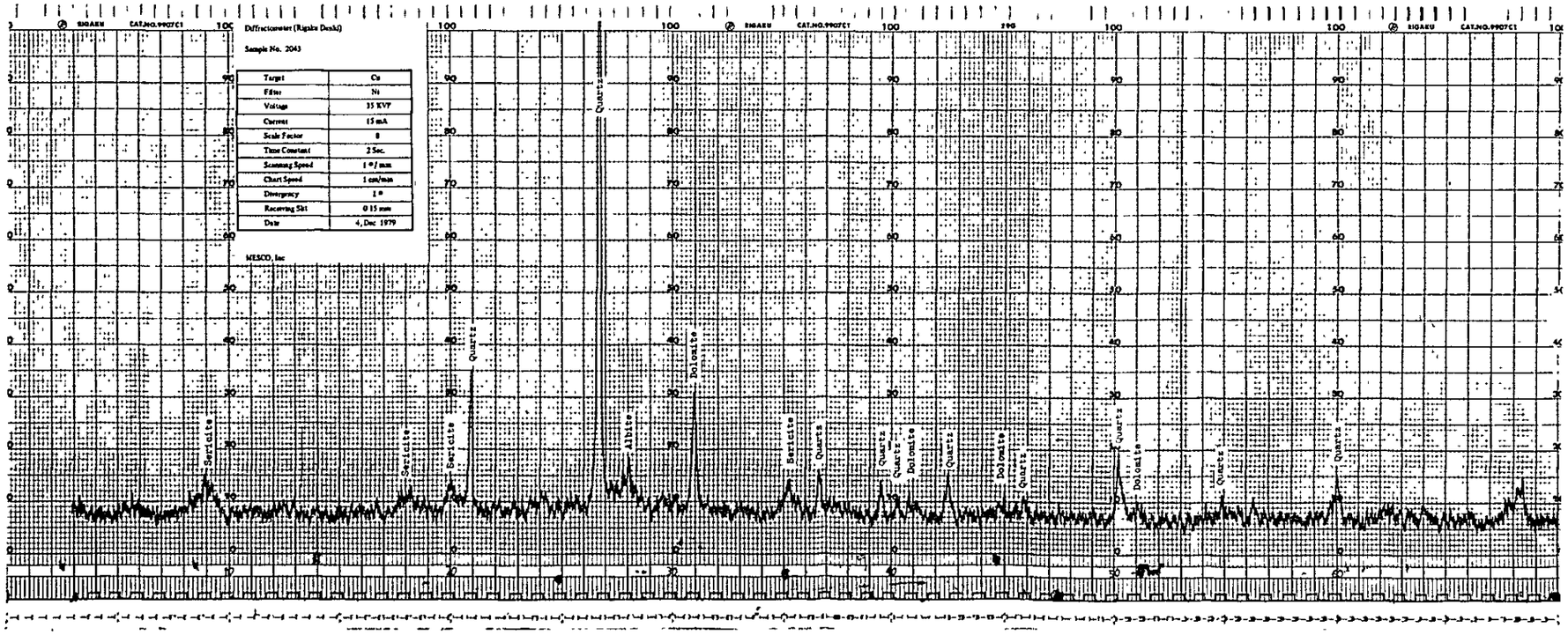
Minerals \ Sample No.	S031	S035	TM6	TM7	TM12	TM13	TM33	TM45	T7	T43	1014	1040	2010	2043	3020	3042	4010	4109	5010	5036	6006
DDH No.											54-1	54-1	54-2	54-2	54-3	54-3	54-4	54-4	54-5	54-5	54-6
Depth m											14	40	10	43	20	42	10	9	10	36	6
Quartz	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎
Albite											○	○		X		X			X	X	
Sericite	△	△	△	△	△	△	△		○	△	○	△	△	△	○	○	△	△	△	X	△
Kaolinite								○	X	X	X				X						△
Montmorillonite													○								
Chlorite	△																				
Dolomite												◎		○		○		○		○	
Calcite																			○		
Pyrite												X								X	

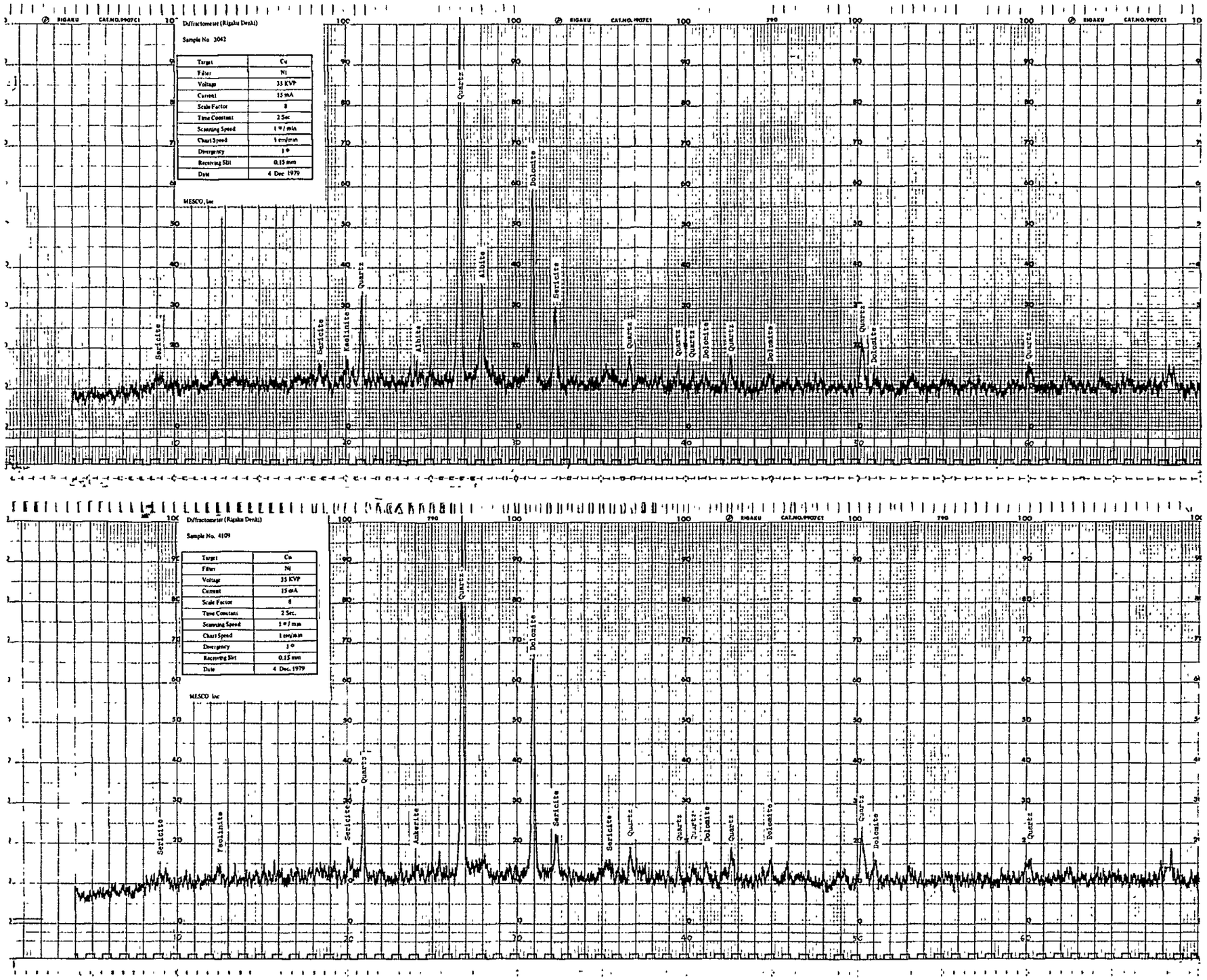
A. I—5 Chart of X-ray Diffraction Test

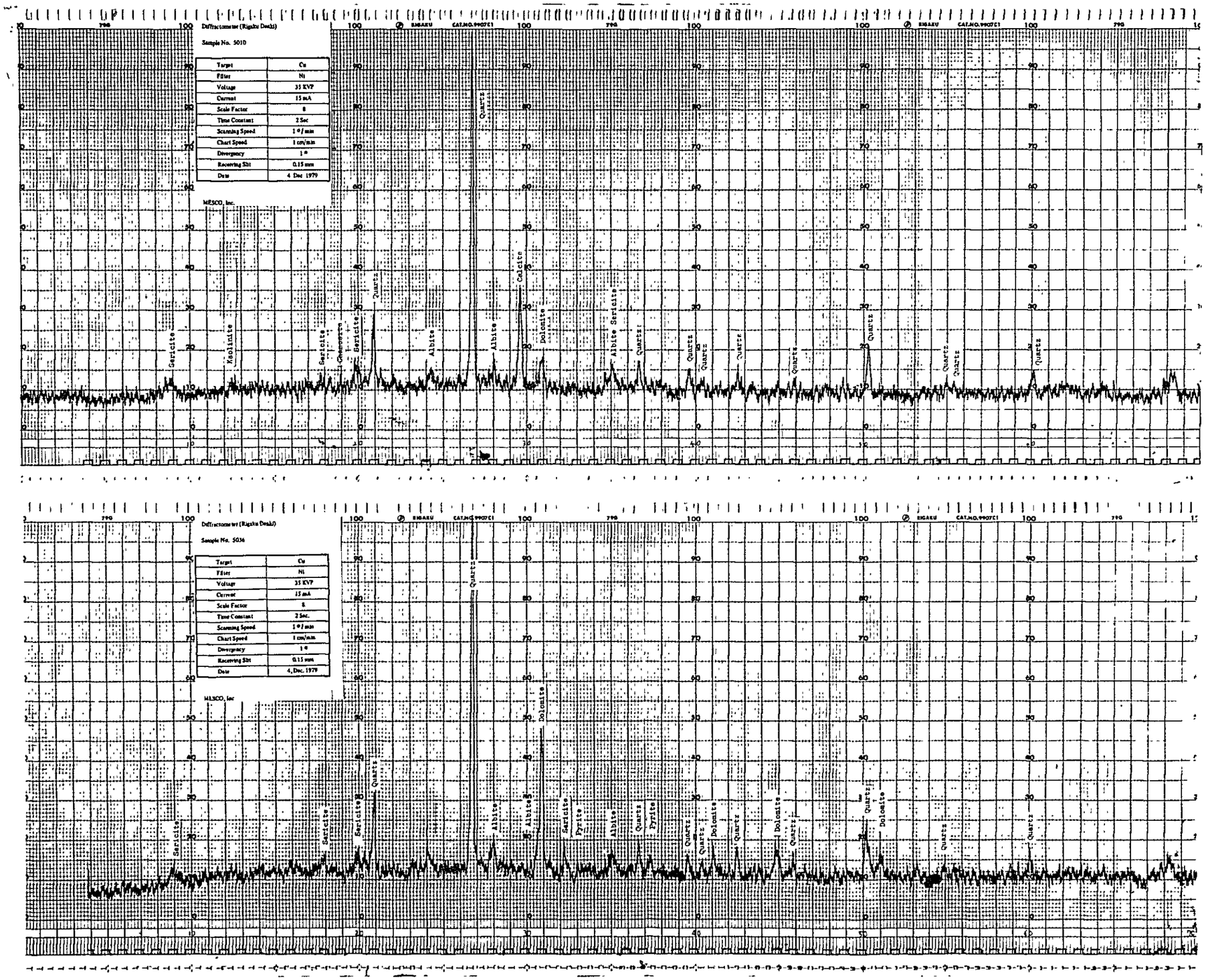



Diffractometer (Rigaku Denki)
Sample No. 1014
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4, Dec. 1979
MESCO Inc.
Kaolinite
Sericite
Quartz
Albite
Composite
Diffractometer (Rigaku Denki)
Sample No. 1040
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4, Dec. 1979
MESCO, Inc
Sericite
Albite
Quartz
Dolomite
Pyrite


Diffractometer (Rigaku Denki)
Sample No. 2010
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4, Dec. 1979
MESCO, Inc.
Montmorillonite
Sericite
Quartz


Diffractometer (Rigaku Denki)
Sample No. 2043
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4, Dec. 1979
MESCO, Inc
Sericite
Quartz
Albite
Dolomite


Diffractometer (Rigaku Denki)
Sample No. 3042
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4 Dec 1979
MESCO, Inc
Sericite
Kaolinite
Albite
Quartz
Dolomite
Diffractometer (Rigaku Denki)
Sample No. 4109
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1°/min
Chart Speed 1 cm/min
Divergency 1°
Receiving Slit 0.15 mm
Date 4 Dec. 1979
MESCO Inc
Sericite
Kaolinite
Ankerite
Quartz
Dolomite


Diffractometer (Rigaku Denki)
Sample No. 5010
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec
Scanning Speed 1 °/ min
Chart Speed 1 cm/min
Divergency 1 °
Receiving Slit 0.15 mm
Date 4 Dec 1979
MESCO, Inc.
Sericite
Kaolinite
Chlorite
Albite
Calcite
Dolomite
Quartz
Diffractometer (Rigaku Denki)
Sample No. 5036
Target Cu
Filter Ni
Voltage 35 KVP
Current 15 mA
Scale Factor 8
Time Constant 2 Sec.
Scanning Speed 1 °/ min
Chart Speed 1 cm/min
Divergency 1 °
Receiving Slit 0.15 mm
Date 4, Dec. 1979
MESCO, Inc
Sericite
Quartz
Albite
Dolomite
Pyrite

A. I—6 Chemical Analysis of Ore Samples

TM-1 ..... Samples of Quartz vein with Limonite

T-1 ..... Samples of Soil

Vueltas del Rio Sector

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	width m	Au	Cu	Pb	Zn		width m	Au	Cu	Pb	Zn
TM-1	0.10	0.30	71	19	340	TM-46	0.50	0.50	261	162	840
2	0.20	0.24	21	5	29	47	0.40	0.20	61	110	190
3	0.40	<0.01	37	4	27	48	1.00	0.02	57	39	385
4	0.50	0.44	13	6	69	49	2.00	0.34	72	625	240
5	0.50	1.18	32	6	24	50	2.00	0.16	18	207	32
6	0.30	6.80	11	2	38	51	0.10	0.86	69	1013	290
7	0.60	11.60	39	1	33	52	1.50	0.14	485	144	990
8	0.60	0.96	28	14	41	53	0.10	0.36	249	21	250
9	1.50	0.48	85	19	79	54	1.00	0.08	5870	30	430
10	3.00	0.34	22	5	20	55	1.50	2.78	378	15	74
11	3.00	0.26	27	9	61	56	0.02	0.10	208	22	310
12	0.50	9.20	31	6	34	57	2.00	0.08	367	67	84
13	1.20	10.40	71	9	18	58	0.50	0.88	89	14	48
14	0.30	4.00	29	12	180	59	1.00	2.00	72	10	220
15	3.00	1.60	30	5	28						
16	3.00	0.56	34	4	16						
17	3.00	0.78	71	6	19						
18	3.00	1.62	36	4	63						
19	0.30	0.06	17	4	34						
20	0.50	0.22	85	7	190						
21	0.10	0.70	33	6	220						
22	1.50	0.18	48	5	31						
23	0.80	0.08	50	4	63						
24	0.40	1.24	178	82	81						
25	0.40	0.14	14	11	45						
26	1.00	0.14	40	11	55						
27	0.10	0.04	36	7	290						
28	2.00	0.30	35	13	19						
29	1.60	0.24	36	12	42						
30	1.00	0.42	50	13	15						
31	0.20	0.02	34	8	73						
32	0.30	0.48	23	10	210						
33	0.30	14.00	55	20	80						
34	3.00	0.24	51	10	61						
35	3.00	0.38	57	24	22						
36	3.00	0.14	86	15	36						
37	3.00	0.10	162	7	48						
38	0.30	0.06	519	12	760						
39	0.30	1.74	47	56	48						
40	0.30	0.06	45	27	71						
41	0.05	<0.01	65	50	230						
42	0.20	<0.01	62	42	150						
43	3.00	0.24	19	120	1030						
44	3.00	0.06	251	39	360						
45	0.10	0.88	27	938	87						

Vueltas del Rio Sector

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	width m	Au	Cu	Pb	Zn		width m	Au	Cu	Pb	Zn
T- 01	0.70	0.36	54	9	100	T- 46	0.70	0.94	174	10	52
02	0.20	2.02	243	30	37	47	1.00	0.22	73	8	59
03	1.00	0.18	355	10	37	48	0.40	1.16	154	7	25
04	0.60	0.12	4340	12	37	49	0.20	0.16	91	6	19
05	0.30	0.28	34	9	41	50	0.20	0.20	161	8	240
06	0.3	0.54	87	10	31	51	0.30	0.44	50	7	21
07	0.40	3.80	71	12	34	52	0.30	0.06	52	4	20
08	0.50	0.14	31	10	21	53	1.20	0.10	146	6	42
09	0.40	0.20	25	10	27	54	0.40	0.10	326	26	26
10	0.80	0.38	16	12	190	55	0.40	0.18	173	12	48
11	0.30	0.12	35	24	7600	56	0.30	0.04	171	3	43
12	0.80	1.92	36	32	49	57	0.40	0.36	52	7	18
13	0.4	0.06	20	7	55	58	0.50	0.24	176	18	29
14	0.50	1.72	15	22	15	59	0.10	0.38	212	11	41
15	0.80	0.04	8	7	53	60	0.60	0.04	190	10	35
16	0.30	0.06	30	14	300	61	0.50	0.04	143	11	45
17	0.20	0.04	22	6	230	62	0.30	0.56	39	16	33
18	0.40	<0.01	12	6	36	63	0.50	0.40	39	18	54
19	0.60	0.12	364	24	36	64	0.40	0.56	49	18	26
20	0.10	0.32	441	28	38	65	0.50	0.06	222	18	31
21	0.30	0.14	389	11	31	66	0.10	0.08	183	16	34
22	0.50	0.06	459	16	49	67	0.55	0.18	337	17	57
23	1.00	0.08	257	6	39	68	0.30	0.56	230	11	35
24	1.10	0.06	81	13	73	69	0.30	0.50	45	11	30
25	0.85	0.04	33	17	56	70	0.45	0.10	48	9	21
26	0.40	0.04	54	26	41	71	0.50	0.44	62	11	23
27	0.40	0.04	184	32	610	72	0.50	0.12	79	16	25
28	0.40	0.08	27	710	23	73	0.50	0.24	163	79	170
29	0.40	0.02	65	7	42	74	0.40	0.10	13	59	79
30	0.20	0.04	19	10	64	75	0.10	0.04	307	10	640
31	0.10	0.02	40	11	66	76	0.50	<0.01	183	33	2100
32	0.50	0.01	220	64	100	77	0.70	<0.01	89	14	6500
33	0.95	<0.01	120	18	54	78	0.40	<0.01	56	31	410
34	0.10	0.02	24	28	47	79	0.10	<0.01	187	567	1600
35	0.40	0.04	56	21	31	80	0.40	<0.01	51	66	370
36	0.30	0.06	34	108	28	81	0.50	<0.01	41	34	340
37	0.50	0.04	358	640	530	82	0.50	<0.01	34	34	210
38	0.90	0.04	48	5	23	83	0.30	0.68	20	733	240
39	0.40	0.16	96	7	50	84	0.30	<0.01	31	53	540
40	0.60	0.30	26	10	28	85	0.35	0.70	273	174	660
41	0.30	0.78	272	11	19	86	0.20	0.04	64	44	530
42	0.50	0.30	142	7	270	87	0.30	0.08	84	29	230
43	2.20	2.18	233	10	35	88	0.60	0.04	56	40	350
44	0.25	1.30	940	12	65	89	0.90	<0.01	229	14	68
45	0.30	1.36	56	6	37	90	0.70	0.04	45	10	46

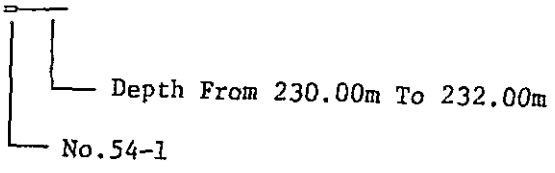
Vueltas del Rio Sector

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	width m	Au	Cu	Fb	Zn		width m	Au	Cu	Pb	Zn
T - 91	0.80	0.90	162	7	56	T -136	0.40	<0.01	75	39	840
92	0.50	0.56	407	7	35	137	0.70	<0.01	79	86	2900
93	0.60	0.08	173	11	150	138	0.40	<0.01	155	66	3300
94	0.60	0.04	347	37	350	139	0.70	<0.01	60	30	220
95	0.70	0.08	87	63	600	140	0.80	<0.01	27	14	620
96	0.80	0.06	46	28	99	141	1.20	0.16	60	76	720
97	0.30	0.12	304	103	1500	142	0.30	0.01	66	500	340
98	0.40	0.58	84	53	650	143	0.20	0.04	288	82	1800
99	0.35	0.04	200	344	1900	144	0.80	<0.01	66	38	640
100	0.15	0.06	129	29	370	145	0.70	<0.01	188	356	1950
101	0.15	0.08	176	86	360	146	0.30	<0.01	10	9	360
102	0.70	0.08	62	29	190	147	0.30	<0.01	12	7	180
103	0.40	0.04	169	24	320	148	0.35	<0.01	33	9	340
104	0.65	0.28	353	3440	2000	149	0.15	<0.01	71	11	290
105	0.30	0.14	65	267	460	150	0.40	<0.01	186	139	560
106	0.50	0.02	15	14	500	151	0.25	0.14	53	17	710
107	0.30	0.16	34	16	290	152	0.50	0.10	231	60	680
108	0.80	0.12	70	80	460	153	0.90	0.04	19	9	19
109	1.50	0.10	380	81	410	154	0.30	<0.01	17	5	45
110	0.50	0.16	452	113	3300	155	0.40	0.06	27	7	27
111	0.60	0.20	589	422	970	156	0.50	0.30	58	13	22
112	0.10	0.10	384	28	4200	157	0.50	0.38	152	11	26
113	0.15	0.12	139	48	4100	158	0.50	3	379	14	58
114	0.30	<0.01	47	54	180	159	0.40	0.14	181	31	870
115	0.60	0.08	80	169	840	160	0.40	0.70	279	19	300
116	0.25	0.08	79	119	460	161	0.60	0.08	138	22	220
117	0.70	0.04	73	20	500	162	0.80	0.12	53	17	59
118	0.80	0.10	58	24	320	163	0.60	0.12	80	17	64
119	0.45	0.12	258	20	300	164	0.80	0.02	46	39	500
120	0.80	0.10	142	16	39	165	0.70	<0.01	173	31	63
121	0.50	0.02	25	24	51	166	0.80	<0.01	253	41	230
122	0.80	0.20	45	9	20	167	0.80	0.08	325	12	74
123	0.45	0.04	39	7	30	168	0.50	0.06	143	29	100
124	0.60	0.06	17	9	43	169	0.50	0.04	555	32	85
125	0.45	0.08	39	7	30						
126	0.50	0.08	55	24	91						
127	0.60	0.08	156	19	69						
128	0.30	0.06	79	11	560						
129	0.80	0.06	405	28	81						
130	0.30	0.04	77	28	750						
131	0.80	<0.01	25	36	2300						
132	1.00	<0.01	37	11	2000						
133	0.60	<0.01	81	58	580						
134	1.00	<0.01	74	27	600						
135	1.00	0.02	86	53	1750						

A. I—7 Chemical Analysis of Drilled Core Samples

Example

Sample No. 1230



Δ ..... checked samples

Vueltas del Rio Sector

No. 54 - 1

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
1000	0.92	3	281	12	69	1082	0.04	1	76	16	410
1002	0.18	1	140	7	42	Δ1082	0.04	1	76	18	410
Δ1002	0.18	1	146	7	42	1084	0.02	1	27	14	480
1004	0.06	1	183	8	310	1086	0.04	1	37	15	350
1006	0.16	1	131	7	47	1088	0.04	1	87	16	410
1008	1	2	242	6	190	1090	0.04	1	52	13	520
1010	0.06	1	183	20	1700	1092	0.04	1	177	13	480
1012	0.10	1	415	6	54	1094	0.04	1	37	19	330
1014	0.06	1	12300	9	740	1096	0.04	1	49	12	350
1016	0.04	1	9350	15	300	1098	<0.01	1	84	15	430
1018	<0.01	1	3140	7	490	1100	0.02	1	25	18	520
1020	<0.01	0.3	20	6	460	1120	0.04	2	51	54	260
1022	<0.01	1	29	6	340	Δ1120	0.04	2	49	54	260
Δ1022	<0.01	1	31	8	340	1140	0.06	2	67	1240	4800
1024	0.01	1	35	10	230	1160	0.04	1	48	16	160
1026	0.02	1	219	15	440	1180	0.02	1	156	19	330
1028	<0.01	1	29	13	270	1200	0.02	1	51	14	96
1030	0.01	1	44	12	190	1220	<0.01	1	38	8	96
1032	<0.01	1	193	18	290	1240	<0.01	1	56	11	100
1034	0.14	2	200	17	170	1248	0.06	1	2500	9	76
1036	0.04	1	120	17	280						
1038	0.06	1	47	11	89						
1040	0.06	1	36	11	140						
1042	0.04	0.4	31	9	67						
Δ1042	0.04	0.4	28	9	67						
1044	0.04	1	26	17	230						
1046	0.04	1	44	67	280						
1048	0.04	1	176	12	2400						
1050	0.06	1	424	12	370						
1052	0.04	0.4	30	12	160						
1054	0.04	1	209	12	310						
1056	0.02	1	225	11	220						
1058	<0.01	1	64	11	340						
1060	<0.01	1	52	15	330						
1062	0.02	1	27	17	450						
Δ1062	0.02	1	28	18	450						
1064	0.02	1	282	24	660						
1066	0.04	1	40	12	480						
1068	0.02	1	195	16	960						
1070	<0.01	1	22	11	600						
1072	0.04	1	195	11	7600						
1074	0.02	1	32	12	550						
1076	0.04	1	30	14	390						
1078	<0.01	1	49	18	430						
1080	0.02	1	66	20	870						

Vueltas del Rio Sector

No. 54 - 2

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
2000	0.04	1	244	24	52	Δ2080	0.02	1	33	10	280
Δ2000	0.04	1	238	27	53	2082	0.02	1	69	11	440
2002	2.54	1	293	12	64	2084	<0.01	1	34	11	56
2004	0.58	0.5	413	8	25	2086	0.02	1	47	17	84
2006	1.52	0.5	413	14	25	2088	0.02	1	57	17	93
2008	0.20	0.4	716	10	20	2090	0.02	1	75	16	72
2010	0.02	0.3	262	9	22	2092	0.04	1	41	14	77
2012	0.04	0.3	239	7	18	2094	0.04	1	45	13	79
2014	0.14	0.4	136	9	31	2096	<0.01	1	41	15	97
2016	0.06	0.1	227	4	19	2098	<0.01	1	184	11	88
2018	0.06	0.05	46	11	25	2100	0.04	1	73	11	200
2020	0.04	0.4	150	10	16	2120	<0.01	1	72	26	81
Δ2020	0.04	0.4	155	8	16	2140	<0.01	1	89	11	75
2022	0.04	0.4	57	12	12	Δ2140	<0.01	1	87	11	70
2024	<0.01	0.4	52	8	25	2160	0.08	1	79	10	74
2026	0.04	0.4	570	7	45	2180	<0.01	1	207	13	61
2028	0.04	0.3	3570	9	440	2200	0.08	1	167	10	60
2030	0.02	0.4	2910	7	550	2220	0.06	1	59	21	99
2032	0.04	1	66	18	520	2240	0.08	1	223	11	230
2034	0.04	1	152	10	610						
2036	0.04	1	1320	13	750						
2038	0.04	0.5	680	10	610						
2040	0.04	1	56	10	380						
Δ2040	0.04	1	56	10	380						
2042	0.02	1	44	10	380						
2044	<0.01	1	52	9	250						
2046	0.01	0.5	1180	11	660						
2048	0.02	1	52	13	330						
2050	<0.01	1	56	8	220						
2052	0.02	1	53	11	90						
2054	0.06	0.4	54	9	16						
2056	0.04	1	57	12	300						
2058	<0.01	0.06	79	13	350						
2060	<0.01	1	44	13	520						
Δ2060	<0.01	1	40	13	520						
2062	<0.01	1	34	11	250						
2064	<0.01	2	33	10	450						
2066	<0.01	1	42	10	270						
2068	<0.01	1	85	9	250						
2070	<0.01	1	31	10	360						
2072	0.01	1	32	14	330						
2074	<0.01	1	35	12	580						
2076	<0.01	1	32	16	260						
2078	0.04	1	29	14	410						
2080	0.02	1	34	11	280						

Vueltas del Rio Sector

No. 54 - 3

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
3000	0.04	1	54	13	88	3082	<0.01	2	147	18	89
3002	<0.01	0.4	87	10	310	3084	<0.01	1	49	11	240
3004	<0.01	<0.01	27	9	18	3086	<0.01	2	46	16	370
3006	0.04	0.5	41	5	42	3088	0.02	1	70	13	59
3008	<0.01	0.4	44	5	13	Δ3088	0.02	1	67	13	63
Δ3008	<0.01	0.4	44	5	13	3090	<0.01	1	41	14	96
3010	<0.01	0.4	61	4	23	3092	<0.01	2	214	16	320
3012	<0.01	0.4	87	7	70	3094	<0.01	2	54	16	370
3014	<0.01	0.4	859	3	17	3096	<0.01	2	44	14	290
3016	<0.01	1	652	7	48	3098	<0.01	2	44	13	310
3018	<0.01	1	464	7	51	3100	<0.01	1	38	11	260
3020	0.04	1	1220	18	98	3120	<0.01	1	79	13	250
3022	0.02	1	357	12	200	3140	<0.01	1	43	13	95
3024	0.04	0.4	433	13	49	3160	1.70	1	52	18	81
3026	<0.01	1	198	12	72	3176	<0.01	1	2230	12	75
3028	<0.01	1	191	14	590	Δ3176	<0.01	1	2230	12	75
Δ3028	<0.01	1	191	13	590	3200	0.04	1	60	14	58
3030	0.06	1	295	10	800	3220	<0.01	1	74	13	370
3032	<0.01	1	68	10	510	3240	<0.01	1	69	13	230
3034	<0.01	1	72	14	650						
3036	0.66	1	163	14	6500						
3038	0.24	1	130	14	4800						
3040	0.06	2	129	14	2500						
3042	0.10	1	198	11	9100						
3044	<0.01	1	213	15	8400						
3046	0.10	1	383	15	3800						
3048	<0.01	9	2160	4100	23000						
Δ3048	<0.01	9	2160	4100	23000						
3050	0.01	1	48	23	270						
3052	0.10	1	50	12	340						
3054	<0.01	1	37	19	520						
3056	<0.01	1	32	18	620						
3058	<0.01	1	198	18	2200						
3060	<0.01	1	454	15	3000						
3062	<0.01	1	450	16	9400						
3064	0.04	1	280	20	8700						
3066	0.04	1	144	16	2000						
3068	0.02	1	58	16	2350						
Δ3068	0.02	1	59	16	2350						
3070	0.06	1	62	15	760						
3072	0.04	2	234	15	3700						
3074	0.04	2	152	18	5000						
3076	0.02	1	114	12	3000						
3078	<0.01	1	53	25	720						
3080	<0.01	1	170	15	500						

Vueltas del Rio Sector

No. 54 - 4

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
4000	0.76	1	590	6	1100	4082	<0.01	1	41	13	470
4002	0.24	1	460	25	710	4084	0.04	1	31	14	400
4004	0.08	0.5	305	4	3000	4086	<0.01	1	43	17	420
4006	0.06	0.5	274	4	3800	Δ4086	<0.01	1	42	17	390
Δ4006	0.06	0.5	274	4	3800	4088	<0.01	1	41	17	500
4008	0.10	1	219	13	3100	4090	<0.01	1	40	16	550
4010	3.24	1	76	14	960	4092	<0.01	1	33	14	530
4012	0.30	1	160	9	780	4094	0.02	1	179	11	4300
4014	0.12	1	160	11	2800	4096	0.04	1	281	10	6900
4016	0.04	1	143	14	980	4098	<0.01	1	51	11	3200
4018	0.04	1	336	19	1600	4100	<0.01	1	186	10	5400
4020	0.06	2	200	21	3100	4109	0.42	1	6280	9	520
4022	0.04	1	276	15	980	4120	0.04	1	63	10	540
4024	<0.01	2	233	31	3500	4140	<0.01	1	45	11	310
4026	<0.01	1	310	21	550	Δ4140	<0.01	1	45	10	320
Δ4026	<0.01	1	319	21	550	4160	<0.01	1	437	7	320
4028	0.08	4	355	83	3400	4180	0.01	0.5	37	4	270
4030	0.08	1	412	14	580	4188	<0.01	1	751	10	330
4032	0.04	2	890	149	24000	4200	<0.01	1	212	7	400
4034	2	1	143	19	2400	4220	<0.01	1	76	26	810
4036	<0.01	1	35	16	260	4240	0.04	1	53	10	2900
4038	<0.01	1	37	9	220						
4040	<0.01	1	52	9	180						
4042	<0.01	1	63	10	260						
4044	0.10	1	94	9	170						
4046	0.20	1	43	10	170						
Δ4046	0.20	1	42	10	170						
4048	<0.01	1	30	9	170						
4050	0.12	1	44	15	240						
4052	0.06	1	94	9	200						
4054	0.26	1	91	19	180						
4056	0.04	1	73	9	220						
4058	0.06	1	188	9	240						
4060	<0.01	2	74	14	630						
4062	0.08	6	805	19	2300						
4064	<0.01	1	374	12	760						
4066	<0.01	1	479	11	4500						
Δ4066	<0.01	1	479	11	4500						
4068	<0.01	2	728	10	570						
4070	0.04	1	191	11	5000						
4072	<0.01	1	326	10	7200						
4074	0.04	1	77	11	4500						
4076	<0.01	1	80	10	380						
4078	<0.01	1	179	10	3700						
4080	<0.01	1	54	16	720						

Vueltas del Rio Sector

No. 54 - 5

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
5000	<0.01	2	175	19	420	5082	<0.01	1	41	15	180
5002	<0.01	3	143	11	410	5084	<0.01	2	38	15	240
5004	<0.01	2	280	11	290	5086	<0.01	2	30	14	190
5006	<0.01	2	19	94	270	Δ5086	<0.01	2	28	14	190
5008	<0.01	2	17	27	520	5088	<0.01	3	18	11	260
5010	<0.01	2	22	39	290	5090	<0.01	3	25	10	230
5012	<0.01	2	45	34	310	5092	<0.01	2	83	10	77
5014	<0.01	3	160	65	335	5094	<0.01	2	146	9	79
Δ5014	<0.01	3	160	65	335	5096	<0.01	1	34	9	75
5016	<0.01	2	39	62	300	5098	<0.01	1	53	10	78
5018	0.06	2	52	31	84	5100	<0.01	2	85	12	210
5020	<0.01	3	70	25	80	5120	<0.01	3	42	12	230
5022	<0.01	2	48	21	84	5140	<0.01	3	60	10	82
5024	<0.01	2	34	16	95	5160	<0.01	3	55	11	62
5026	<0.01	2	15	9	250	Δ5160	<0.01	3	59	11	61
5028	<0.01	2	17	12	200	5180	<0.01	2	72	16	71
5030	<0.01	2	124	10	270	5200	<0.01	1	76	16	99
5032	<0.01	2	35	12	270	5220	<0.01	1	72	15	58
5034	<0.01	2	53	9	240	5240	<0.01	1	28	11	65
Δ5034	<0.01	2	53	8	240						
5036	<0.01	2	61	12	94						
5038	<0.01	2	20	13	220						
5040	<0.01	2	16	12	300						
5042	<0.01	2	15	14	290						
5044	<0.01	2	21	13	100						
5046	<0.01	2	24	13	340						
5048	<0.01	2	54	12	76						
5050	<0.01	2	68	26	250						
5052	<0.01	2	140	16	290						
5054	<0.01	2	58	12	89						
Δ5054	<0.01	2	56	12	88						
5056	<0.01	2	35	13	61						
5058	<0.01	2	28	26	66						
5060	<0.01	2	24	16	51						
5062	<0.01	2	31	36	92						
5064	<0.01	2	32	14	65						
5066	<0.01	16	66	12	63						
5068	<0.01	3	154	15	65						
5070	0.02	2	28	17	270						
5072	0.02	2	41	20	71						
5074	<0.01	2	26	16	84						
Δ5074	<0.01	2	24	16	84						
5076	0.02	2	244	17	280						
5078	0.01	2	244	24	200						
5080	<0.01	2	383	14	79						

Vueltas del Rio Sector

No. 54 - 6

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
6000	0.04	2	368	67	2000	6082	<0.01	1	35	10	210
6002	0.04	1	384	79	2600	6084	0.01	1	180	9	260
6004	0.04	1	414	132	2400	Δ6084	0.01	1	190	10	260
Δ6004	0.04	1	414	130	2400	6086	0.04	1	84	8	420
6006	0.50	1	334	131	3500	6088	<0.01	0.5	49	8	280
6008	0.04	1	307	113	1800	6090	0.08	1	93	14	270
6010	0.04	1	173	17	3100	6092	<0.01	0.5	51	9	81
6012	0.06	1	168	26	2700	6094	<0.01	0.5	61	9	83
6014	0.02	0.4	145	45	850	6096	<0.01	1	46	21	1050
6016	<0.01	1	276	71	1900	6098	<0.01	1	37	8	160
6018	0.01	0.5	164	28	1700	6100	<0.01	0.5	40	7	180
6020	0.02	0.5	224	28	2100	6120	<0.01	1	68	14	380
6022	0.04	3	149	71	3000	6140	0.10	4	179	23	850
6024	0.02	1	28	19	4600	Δ6140	0.10	4	179	23	850
Δ6024	0.02	1	26	19	4600	6160	0.02	0.5	357	10	290
6026	0.04	1	42	20	3400	6180	<0.01	1	36	11	200
6028	<0.01	0.3	18	3	2700	6200	<0.01	0.5	25	5	140
6030	<0.01	0.2	25	6	580	6220	<0.01	0.3	29	14	70
6032	<0.01	1	52	18	490	6240	<0.01	1	57	11	180
6034	<0.01	0.5	52	20	210						
6036	<0.01	1	75	20	780						
6038	0.02	1	92	22	540						
6040	<0.01	0.5	60	11	270						
6042	<0.01	0.5	92	8	190						
6044	<0.01	0.5	62	8	150						
Δ6044	<0.01	0.5	62	8	150						
6046	<0.01	1	170	10	180						
6048	<0.01	0.5	69	8	170						
6050	<0.01	0.5	22	12	160						
6052	<0.01	0.5	69	8	630						
6054	<0.01	0.3	29	9	300						
6056	<0.01	1	25	11	86						
6058	<0.01	1	46	12	77						
6060	<0.01	1	69	11	88						
6062	0.01	0.4	31	11	89						
6064	<0.01	1	41	13	94						
Δ6064	<0.01	1	41	12	100						
6066	<0.01	1	35	10	79						
6068	<0.01	1	42	12	79						
6070	<0.01	1	47	11	86						
6072	<0.01	1	43	14	100						
6074	<0.01	1	39	15	88						
6076	<0.01	1	52	11	260						
6078	<0.01	1	41	8	93						
6080	0.01	1	37	11	270						

Vueltas del Rio Sector

No. 54 - 7

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
7000	0.08	4	24	29	87	7208	<0.01	1	28	16	78
7002	<0.01	6	26	31	150	Δ7208	<0.01	1	29	15	78
7008	<0.01	1	47	36	310	7210	<0.01	1	133	12	170
7010	<0.01	1	55	29	200	7212	<0.01	1	32	17	82
7012	<0.01	1	44	36	200	7214	0.02	2	42	125	101
7014	0.10	1	49	67	230	7216	<0.01	1	41	22	34
7016	0.02	1	41	36	200	7218	0.02	1	38	19	94
7018	<0.01	1	52	37	230	7220	0.02	1	44	21	74
Δ7018	<0.01	1	50	37	230	7222	0.02	1	33	50	3200
7022	<0.01	1	55	36	300	7224	<0.01	1	46	27	97
7024	<0.01	1	48	31	360	7226	<0.01	1	36	20	85
7026	0.06	0.5	47	44	290	7228	<0.01	1	30	21	250
7031	0.06	1	49	34	220	Δ7228	<0.01	1	30	20	250
7042	<0.01	0.5	52	36	240	7230	<0.01	2	40	20	78
7154	<0.01	1	208	44	680	7232	<0.01	1	78	21	98
7155	<0.01	1	67	37	1400	7234	<0.01	1	52	21	320
7157	<0.01	1	71	104	2000	7240	<0.01	1	59	56	570
7158	0.20	1	200	196	4900	7260	<0.01	1	39	23	350
7159	0.02	4	51	413	2300	7280	<0.01	1	43	21	42
7160	<0.01	1	127	60	730						
7162	<0.01	2	46	69	440						
7164	<0.01	1	29	69	280						
7166	0.06	1	19	67	81						
7168	<0.01	2	21	325	260						
Δ7168	<0.01	2	21	325	260						
7170	<0.01	1	25	165	5500						
7172	<0.01	2	39	570	1900						
7174	<0.01	1	116	538	1020						
7176	0.01	2	41	413	520						
7178	<0.01	2	22	313	420						
7180	0.04	1	28	54	90						
7182	0.02	1	26	82	140						
7184	0.08	2	77	450	520						
7186	0.02	1	363	56	130						
7188	<0.01	1	47	25	180						
Δ7188	<0.01	1	43	25	180						
7190	<0.01	1	47	26	55						
7192	<0.01	1	50	25	58						
7194	<0.01	1	42	35	170						
7196	<0.01	1	37	27	85						
7198	<0.01	2	28	26	84						
7200	<0.01	2	34	19	97						
7202	<0.01	1	56	14	67						
7204	<0.01	1	34	16	63						
7206	<0.01	1	78	25	190						

Vueltas del Rio Sector

No. 54 - 8

Sample No.	Elements analysed (ppm)					Sample No.	Elements analysed (ppm)				
	Au	Ag	Cu	Pb	Zn		Au	Ag	Cu	Pb	Zn
8000	0.04	4	16	22	345	8198	0.02	1	210	385	715
Δ8000	0.04	4	16	22	345	Δ8198	0.02	1	205	400	715
8004	<0.01	1	39	17	54	8200	0.02	1	198	166	430
8008	<0.01	1	42	34	180	8202	0.02	1	77	149	170
8010	<0.01	1	41	30	250	8204	<0.01	1	280	29	87
8018	<0.01	1	40	19	180	8206	<0.01	1	228	19	200
8118	0.01	1	83	19	490	8208	<0.01	1	52	12	64
8128	0.06	0.3	24	12	58	8210	<0.01	1	276	51	170
8130	0.06	0.3	26	14	73	8212	<0.01	2	215	216	510
8132	<0.01	0.5	28	21	46	8214	0.06	1	79	49	170
8134	<0.01	0.3	44	13	280	8216	0.08	1	68	63	180
8136	<0.01	0.3	44	16	210	8218	0.06	1	205	44	350
8138	<0.01	0.3	51	9	230	Δ8218	0.06	1	200	43	350
Δ8138	<0.01	0.3	51	10	230	8220	0.02	1	63	34	86
8140	0.02	0.3	71	7	60	8222	0.06	1	273	66	270
8142	0.08	0.3	43	7	85	8224	<0.01	1	180	49	180
8144	0.01	0.5	59	21	260	8226	<0.01	1	207	79	550
8146	<0.01	0.5	224	47	270	8228	<0.01	1	67	43	57
8148	0.08	1	563	89	320	8230	<0.01	1	52	36	86
8150	<0.01	1	40	101	550	8232	<0.01	1	83	56	86
8152	<0.01	0.3	15	29	93	8240	0.08	4	5100	16	260
8154	<0.01	1	15	52	83	8260	0.04	1	82	17	240
8156	<0.01	0.5	15	35	260	8280	0.04	1	52	20	245
8158	<0.01	0.5	19	27	230	Δ8280	0.04	1	65	17	245
Δ8158	<0.01	0.5	20	27	230						
8160	<0.01	0.5	28	31	310						
8162	<0.01	1	39	57	200						
8164	<0.01	0.5	27	54	80						
8166	<0.01	0.5	19	56	62						
8168	0.08	2	144	99	220						
8170	0.06	1	71	225	310						
8172	0.02	1	56	209	700						
8174	<0.01	1	90	100	89						
8176	<0.01	1	250	150	240						
8178	0.04	1	140	51	67						
Δ8178	<0.01	1	153	44	67						
8180	<0.01	1	32	21	35						
8182	<0.01	0.5	29	14	41						
8184	<0.01	1	24	20	40						
8186	<0.01	1	34	56	40						
8188	<0.01	1	27	20	45						
8190	<0.01	1	39	15	35						
8192	<0.01	1	87	24	27						
8194	<0.01	4	2880	64	210						
8196	0.04	1	240	117	210