Memo:
Carnierinho Au Property

June, 2007

R. Therriault
APEX Geoscience
Edmonton, Ab

SUMMARY

The Carnierinho Property (the "Property") is situated approximately 220 km SSW of Itaituba within the Tapajos Gold Province. The property is dominated by a 1.87 Ga post-orogenic suite of coarse grained K-rich granitoids (syenites to syenogranites) termed the Maloquinha Group. Later, more evolved, finer grained structurally controlled and probably magmatically related granitoids, aplites, felsic dykes/possible stocks and quartz veins intruded into the Maloquinha. Siliciclastic sediments of the Buiucu Group occur on the southwest part of the property as a shallowly NE dipping package of Maloquinha derived siliciclastic sediments.

No effects of metamorphism have been observed within any of the suites, while deformation is restricted to relatively common brittle fractures often exploited by quartz veins, faults and rare shears. Hydrothermal alteration appears to be largely structurally controlled. This is particularly obvious on the Carneirhino trend. Saprolitization has affected all rocks on the property to some degree, particularly the later fine grained granitoids which tend to be more hydrothermally altered than the coarse grained Maloquinha syenogranites. Despite this, textures and structures tend to be preserved well enough for mapping purposes. Outcrop is sparse, with the best exposure being within the various garimos, along drainages and on roads.

Gold mineralization on the property tends to be difficult to identify as many of the old garimpos are water filled and tailings piles are widespread. Furthermore, the sulphides that are present tend to be low in abundance and typically oxidized. It appears that all granitic phases on the Property can be mineralized, however, the vast majority of the garimpos visited are spatially associated with the late fine grained intrusives. Higher gold values do correspond with elevated pyrite, which typically occurs as highly oxidized euhedral disseminations in the granitoids or, less commonly, in quartz veins. Based on the active mining, much of the Au appears to be free and coarse.

All of the mining on the Property has focused on the easily removed saprolitic cover. A minor amount of exploration by various companies has dealt with the underlying hard rock. Select results from trenching in the garimpos by TVX and Placer Dome are shown below:

Antonio De Luca pit 1: 12.6g/t over 26m and 34.57g/t over 1.5m
Antonio De Luca pit 2: 10.83g/t over 7m and 23.91g/t over 1.5m
Deusdeth: 12.06g/t over 2m and 7.43g/t over 0.6m

Mineralization on the Carnierinho Property is likely of the intrusion hosted/intrusion related type as seen in the Tintina Gold Belt in the Yukon and Alaska. Vein textures and mineralogy suggest a high level extensional setting involving a low sulphide gold bearing oxidized magmatically driven structurally controlled system with aerially restricted alteration in a post orogenic (collapse stage) setting. A major NE trending fault links together many of the garimpos on the Carneirhino trend. This fault presumably acted as a fluid conduit resulting in the adjacent hydrothermal alteration and mineralization in the

area. Au in soil anomalies on the Property correspond with magnetic lows. It is believed that these areas are underlain by the later felsic intrusives. Based on the spatial association of these granitoids with Au, these areas may show potential for intrusion hosted or porphyry style Au mineralization.

REGIONAL GEOLOGY

The Tapajos Gold Province is situated within the allochthonous Paleoproterozoic Tapajos-Parima tectonic belt. An oceanic-continental orogenic event (Tapajos-Parima or Tapajos Ventuari) associated with an east-dipping subduction zone took place between 1.87-2.10 Ga. The earlier phases of the orogen saw the development of at least two subduction-derived predominately calc-alkaline arcs which were subsequently accreted onto the ~2.1 Ga Jacareacanga Group volcano-sedimentary trench basin. The older of the two arcs is represented by the Cuiu-Cuiu Complex, the Vila Riozinho Formation and the Creporizao intrusive suite and ranges in age from ~1.957-2.125 Ga. The younger of the two is represented by the Abacaxis & Sequeiro Formations, the Parauari intrusive suite and the Ingarana intrusive suite, and ranges in age from 1.873-1.900 Ga. The earlier stage of the orogen was also associated with thrust faulting and the development of a NNE-SSW fabric, particularly in the Cuiu-Cuiu Complex. The latter stages of the orogen saw the intrusion of a number of calc-alkaline to alkaline granitoids and their extrusive equivalents. The post orogenic subalkaline to alkaline Maloquinha granitoids and their extrusive equivalents, the Moraes Almeida Formation, were the final expressions of the Tapajos-Parima orogeny. Late in the orogen a switch from compression to transpression was manifested as (reactivated) NNE trending brittle to ductile crustal-scale faults which eventually became extensional structures (graben/half graben) during orogenic collapse. These late structures became the focus of post orogenic sedimentation (Buiucu Formation) in wrench/pull apart basins. Pre/syn dating (sub) alkali granites of the Maloquinha suite were partially structurally controlled by these late structures as well as later cross-cutting NW trending structures. The post orogenic Maloquinha and Buiucu groups are the primary lithologies on the Carneirinho Property and are thus the focus of this paper.

PROPERTY GEOLOGY

The Carneirinho Property is dominated by coarse grained syenites to syenogranites of the post orogenic 1.87 Ga Maloquinha Suite. They are characterized by coarse potassium feldspar (K-spar), biotite, amphibole, minor plagioclase and variable amounts of quartz. When quartz is abundant it forms large (up to 1cm) crystals. Post Maloquinha high-level fine to medium grained “felsites” are also common as dikes and probable stocks and tend to be spatially associated with mineralization. Strong saprolitization makes it difficult to identify its mineralogy, but scattered K-spar phenocrysts seem to be a consistent feature. Siliciclastic rocks of the Buiucu Formation appear to be restricted to a NE(?) trending basin in the SW part of the property. Amphibole phyric quartz diorite/granodiorite plugs cut the Maloquinha in the north part of the property. Cherty laminated volcanic-derived?

rocks occur in boulder form to the south of camp and may represent the extrusive counterpart to the late felsites.

As previously mentioned, brittle fractures are the primary manifestation of deformation on the property. Fractures crosscut all lithologies and often parallel/host quartz veins. Thin, parallel to anastomosing clay/limonite bands crosscut obviously hydrothermally altered and mineralized granitoids, particularly in the hangingwall of the Antonio De Luca Pit #2 (Joao Pinto). A major (15-20m) NE trending NW dipping fault links together a number of the garimpos along the Carneirhino trend. Strong deformation and alteration make the precursor lithology impossible to identify. This fault is regarded as the primary conduit for migrating gold bearing hydrothermal fluids.

The following is a description of a number of site-specific geologically interesting areas on the property. The accompanying map provides locations for these sites. An attempt to reconcile the various spot locations into a coherent genetic model for the Property is dealt with under "Discussion."

Antonio De Luca Pit #1 (538844/9341447)

A day and a half was spent mapping and sampling the exposure in the currently active Antonio De Luca Pit #1 at the SW end of the Carnierhino trend. The accompanying 1:500 map illustrates the major structures, lithologies and samples within the pit. 1-10 cm quartz veins exhibit three major trends. In order of abundance, they are:

Type 1: 325-340/48
Type 2: 045-065/70
Type 3: 100/80

Each of the veins are texturally and compositionally similar. Cryptocrystalline textures dominate, however, drusy quartz was also noted. Type 1 & 2 veins form so-called "ladder veins" in a few areas. Based on their strikes and dips, these networks rake to the SE. Poor examples of sinistral (Type 2 veins) and dextral (Type 1 veins) movement were noted in a couple of spots.

Two main lithologies are present in the pit; coarse grained quartz syenite occurs to the south while the northern part of the pit is dominated by a strongly saprolitized medium grained variably K-spar porphyritic granitoid of uncertain composition. It is tentatively correlated with the medium grained granitoid seen at the Antonio Josa garimpo to the west and the granitoid in the Claudomere pits. Clasts of coarse quartz syenite in the medium grained phase provide relative timing of the two intrusions. The contact between the two phases trends 110-120 dipping shallowly (~40) to the SW. According to reports, the Antonio De Luca pit exploited the footwall region of a NE trending deformed mafic dyke or sharply bound fault which correlates with the one at Antonio De Luca pit # 2.

The quartz veins are almost entirely hosted within the medium grained granite. One example of a quartz vein cutting the contact between the two phases was noted; the vein is strongly refracted due to rheological contrasts and pinches out after ~20cm. This suggests the coarse quartz syenite was not as amenable to fracturing & veining as the finer grained phases.

No sulphides were noted in the veins or the granite, however, it is quite obvious that it is the medium grained granitoid (and potentially the quartz veins) that are the hosts to gold. Panned gold from the garimpo indicates that a significant fraction of the gold is quite coarse (up to 1mm flecks/colours).

Antonio De Luca Pit #2 (~538925/9341600)

Good exposure along the rim of the Antonio De Luca Pit #2 provided an opportunity for detailed structural analysis. The area consists of coarse grained quartz syenites of the Maloquinha Suite crosscut by a ~15-20m fault or faulted dyke. The fault/dyke exhibits a NE trend (220-240) and dips to the northwest at ~70. The full strike extent of the fault/dyke is unknown, but can apparently be traced from the north part of Antonio De Luca pit #1 through two other now covered pits to the NE of Antonio De Luca pit #2. It likely correlates with a strongly foliated (220/70) area of Maloquinha granites to the north. The strong fabric within the dyke and thin clay/limonite (after K-spar?) veinlettes have an orientation similar to the contact. A single Z-shaped fold suggests some dextral movement along this contact, which is contrary to what has been previously reported. Based on pit geometery and semi-coherent discussions with the locals, the majority of the mineralization is situated within the hangingwall region of the fault/dyke, predominately in the coarse quartz syenites. Although heavily saprolitized, the hangingwall rocks as well as the fault/dyke are obviously hydrothermally altered and moderately stockworked by thin clay/limonite +/- quartz veins.

Of particular interest are a cluster of thin 1-5cm near-pure sphalerite veins which occur on the SE margin of the pit. There does not appear to be any consistent orientation to the veins, with values ranging from 024/70 to 304/77 to 220/30 to 117/? It is not yet known if these veins are related to the gold mineralization, however, discussions with Antonio De Luca suggest that sphalerite did occur in some of the material that was mined in the pit.

Claudomere Pit #1 & 2 (537950/9341284 & 537749/9341356)

Work at the Claudomere garimpos has shown that mineralization at both is related to felsic dyking. One of the high-gold areas in the Claudomere #1 pit corresponds to the hangingwall of a 3m dyke/fault which crosscuts a fine grained (quartz porphyritic?) granitoid. The dyke strikes at ~300^{o} dipping 75^{o} to the NE. It is not known if the dyke itself is mineralized. At the north end of the pit the granitoid contains a large concentration of decimetre to metre scale xenoliths of mud/siltstone. Felsic dykes at the Claudomere Pit #2 show similar trends but appear to be steeper than at Pit # 1.

Antonio Josa Garimpo (536909/9342324)

The Antonio Josa garimpo is an active pit located in the western part of the property. The host rock is a medium grained granitoid with rare K-spar phenocrysts (correlative with the granitoid at Antonio De Luca Pit #1?). 1-10 cm quartz veins have trends ranging from 070 to 100 dipping south at 50-60. Thin clay shears/fractures trend 360/040 while a 10cm felsic dyke trends at 076/85 and is truncated by a small fault/fracture at 350/65. Coarse vein-related crystals of amythyst are common in the western garimpos as is hematite in veins.

Pork Showing

Mineralized quartz vein cobbles and boulders were located north of the Carneirhino garimpos on a small drainage in the north part of Grid A (539025/9342195). A number of varieties of quartz vein cobbles were present, however, only one type contained pyrite mineralization. They consist of weakly saccharoidal to cryptocrystalline pink coloured veins – a result of hematite inclusions in quartz. Pyrite occurs up to 10% as fine (<1mm) to coarse (up to 5mm) euhedrons in monomineralic clots and along vein fractures with fine grained hematite. The mineralized cobbles/boulders occur over an area of ~30m with sharp boundaries. Evidence of old workings are obvious. The presence of hematite may prove to be a good indicator of Au mineralized veins in other as of yet undiscovered veins. It is also an indicator of oxidized fluids.

Northeast Garimpo Trend

The area to the NE of the Antonio De Luca pits is dominated by coarse grained (quartz) syenite. There are a number of old garimpos in this area, however, poor access due to water at the bottom of the garimpos made it difficult to identify the mineralized zones. According to Antonio De Luca, pyrite was quite common in the mined material while mineralized zones strike extents tended to be poor. A few examples of hydrothermally altered granite were identified and sampled.

A small group of outcrops in the northeast exhibit a strong fabric characterized by 10cm elongate oriented ellipsoids (lithons?) and a pervasive “woody” or cleavage-like fabric trending 220/70. It is likely that this is the north extension of the fault seen at Antonio De Luca pit #2.

Silicious Chert Boulders

One of the more interesting discoveries on the property was a unit of silicious laminates. The package has only been observed in boulder form in the drainages to the south and west of Carneirinho village (see map). They consist of 2-5 mm laminations of chert separated by sub mm (clay?) segregations. Bulbous stromatolite-like occurrences are rare, while low-amplitude wavy to planar laminated structures are common. Approximately 20% of the boulders in the aforementioned drainages are slightly coarser

silty to sandy beds/laminations (felsic volcaniclastics? siliciclastics?). A few possibilities for the origin of this unit are proposed below:

1) Laminated/sheeted veins
2) Archean aged chemical precipitates
3) Part of the overlying Buiucu formation
4) Post Maloquinha syn-felsite felsic volcaniclastics or hot-spring like chemical precipitates related to surficial felsite/silica "blowouts" of the hydromagmatic system.

The first option is not likely considering the amount and thickness of the boulders as well as the textural homogeneity of the unit (the veins tend to show much more variability in textures). The second option is also unlikely as an enclave of Archean rocks within this plutonic domain would be strongly deformed and baked. The third option does not seem very likely either, as the Buiucu sediments are (exclusively?) poorly sorted fluvial siliciclastics derived from the collapsing orogen and deposited into fault bound basins. Thus, the final option is probably the most likely. Their geographic position appears to be controlled by the already formed basins hosting the Buiucu formation.

Southwest Anomaly

The magnetic low in the SW is caused by a package of aerially restrictive sedimentary rocks comprised of decameter-scale poorly bedded homogenous dirty sandstones (arkoses) quite obviously derived from the Maloquinha granitoids. The thick sandstone beds are interrupted by thinner (metre-scale) beds of laminated mudstones and siltstones. These rocks are best (and probably only) exposed along the drainage marked on the accompanying map. The more resistant sandstones form steep waterfalls, while the mud/siltstones form near-horizontal areas in the drainage. Approximately 50m of stratigraphy was observed. The sedimentary package ranges from horizontal to low angle (20) NE dipping. It is possible that these sediments are part of the younger (Phaneroizoic?) cover, but it is more likely that they are post 1.87 Ga Maloquinha-derived sediments infilling a ~NE trending post orogenic wrench/pull apart (extensional) basin. A better understanding of the regional distribution and characteristics of the Buiucu Formation would help to resolve this.

This sedimentary basin not only explains the large magnetic low but also the low Au values associated with the area. Although the area is not considered a high priority at the present time, it should be noted that:

1) The sandstones look extremely similar to the fine-grained intrusives seen elsewhere on the property. Care should be taken when attempting to distinguish between the two, particularly when only boulders are present. In general, the sandstones tend to be poorer in quartz and richer in mafics than the felsites. Bedding is rarely seen in the sandstones.
2) The margins of post-orogenic basins are typically bound by faults which are ideal conduits for late-stage high-level magmatism/hydromagmatism as seen elsewhere

on the property. This is not dissimilar from the Temiskaming-Syenite Au association which is an intrusion hosted style deposit.

Quartz Hill

Near the top of the mountain close to where the road splits just north of camp there is a decameter (or larger) quartz +/- feldspar intrusive body. The unit consists of coarse to coxcomb textured quartz crystals in a variably voluminous matrix of fine to very fine quartz. Thus, the unit underwent two stages of cooling. It is thought that the unit intruded as a highly evolved viscous crystal-rich mush which subsequently cooled quickly near surface. The intrusion as well as a wide margin around it is strongly brecciated. Vuggy textures within the felsite indicate a volatile rich phase, which probably contributed significantly to the phases power to brecciate the surrounding wallrock. Hematite occurs in notable quantities within this unit suggesting an oxidized system. Quartz clasts are common marginal to the intrusive, decreasing in number away from the intrusion. A similar breccia unit occurs along the camp airstip and at the bottom of the mountain north of camp. Interpretation of this unit is currently inconclusive, but it may be the brecciated carapace to the felsite unit described above. At least some of the "clasts" are probably related to loose material being pushed into the saprolite during road use, so care should be taken when studying this unit.

DEPOSIT TYPES

A number of different deposit types have been discovered/proposed for Au showings within the Tapajos Gold Province. They range from the deep-seated orogenic to high-level epithermal or porphyry to intrusion hosted (Yukon-Tanana Tintina style) to iron-oxide-copper-gold/Olympic Dam type. It is not unlikely that all these deposits exist, however, a regimented review of them is beyond the scope of this paper. It is, however, recommended that a more thorough review of the deposits in the Tapajos Gold Province be completed with particular focus on age of host and depth of mineralization ie) it is conceivable that a continuum of deposits, from orogenic to epithermal, does exist. The present paper focuses on the post orogenic granitoids found on the Carnierinho Property, but future studies should attempt to better position this area within the context of the entire Au province. Much of this can be accomplished by using existing literature, particularly the work by the Brazilian survey.

The likelihood that some, if not many of the deposits associated with the Maloquinha intrusions are intrusion hosted or intrusion related is considered good by the author. As a result, noting Sn-W occurrences (eg. Tocantinzinho) as well as Au-Bi-W-As-Mo-Te +/- Sb associations may be prudent. It is also worth mentioning that granitoids on the Property exhibit a weak-moderate radiogenic signature. This may prove to be important from a genetic standpoint as radiogenic granites can contribute significantly to the heat budget of a hydrothermal system, driving it for longer periods of time. Indeed, the radiogenic effect is implicated as a significant contributer to the energy budget of the Sn

systems of Cornwall. This too is interesting as comparisons between intrusion hosted Au and the felsic hosted sheeted vein arrays of certain Sn deposits.

A clear understanding of intrusion hosted/related deposits, their host rocks, tectonic settings and geochemisty does not yet exist in the literature, however, some tentative characteristics based primarily on the Tintina Gold Belt are provided by Lang and Baker (2001) and are listed below:

1) Metaluminous subalkaline intrusions of intermediate to felsic composition near the boundary between magnetite-ilmenite series.
2) Carbonic hydrothermal fluids.
3) Au-Bi-W-As-Mo-Te-Sb and low concentrations of base metals.
4) A low sulphide mineral content, mostly <5%, with a reduced mineral assemblage (arsenopyrite-pyrrhotite-pyrite), lacking magnetite-hematite.
5) Aerially restrictive, commonly weak hydrothermal systems except in systems formed at the shallowest depths.
6) Tectonic setting well inboard of inferred or recognized convergent plate boundaries where continental magmatism commonly contains coeval intrusives of alkalic metaluminous calc-alkaline and peraluminous compositions.
7) Location in magmatic provinces known for Sn-W.
8) Exhibit structurally controlled mineralization.

Suggestions that the Carneirhino system and other nearby similar deposits are epithermal in nature have been made by a few geologists. Specifically, the low sulphide Korean-type epithermal system (adularia-sericite) is proposed as a genetic model for some of the high-level deposits in the Tapajos Gold Belt. In general, epithermal systems are hosted in volcanic rocks and have a strong base metal signature. This is not the case on the Carneirhino Property. Furthermore, adularia has not been identified by the author or reported in any of the literature (including petrography analyses) regarding this deposit.

MINERALIZATION

A few different styles of mineralization are recognized on the Carneirhino Property and are discussed below:

1) Zones associated with pervasive but aerially restricted structurally controlled hydrothermal alteration and mineralization eg. hangingwall of fault/faulted dyke at Antonio De Luca #2. The alteration assemblage is difficult to identify in the saprolite altered material, but is characterized by a more yellow-orange to red-brown colour likely caused by (hydrothermal?) hematite, clay/limonite veinlettes, carbonate, secondary Fe-Mn oxides, sulphides and potentially sericite. At least some of the associated gold is free, with or without pyrite present. 2007 drilling should help to better define this style of alteration/mineralization.

2) Quartz-pyrite veins as seen in the drainage on Grid A. The source of these cobbles and their Au contents are not yet known. They contain fine disseminations of hematite imparting a light pink colour to the rock and distinguishing them from other unmineralized cobbles in the area. The vein textures range from cryptocrystalline to weakly saccharoidal which may suggest a somewhat deeper level system as compared to the drusy/coxcomb veins. Pyrite occurs in concentrations of up to 10% as euhedral multicrystal intergrowths or clots. Due to the large amount of quartz float on the property, this style of mineralization requires some effort to find.

3) Potentially barren quartz veins widely distributed throughout the property. These veins generally do not contain significant sulphides, but are spatially associated with the first style of mineralization. Free gold has been reported in them. The vast majority of these veins show extensional features.

4) Cm-scale sphalerite veins situated within the fault/faulted dyke at Antonio De Luca Pit #2. These veins have a number of orientations, limited strike extent, limited depth extent and a limited geographical distribution. Nevertheless, in the right concentrations (ie. stockworks) they may prove to be of economic significance. Their relationship with gold is currently unknown.

The most notable feature of the mineralization on the Carnierinho Property is the overall paucity of sulphides and abundance of vein-related quartz. Much of the quartz could conceivably be related to significant erosion of the syenogranites, however, metre-scale quartz boulders attest to a voluminous hydrothermal system. Vein textures range from the ordinary milky/smoky homogenous cryptocrystalline to aphanitic banded to white/pink saccharoidal to coarse/very coarse drusy/coxcomb style, sometimes with large amythyst crystals. Such textures are quite clearly related to a high-level extensional setting. Furthermore, vein textures mimic those seen in the late high-level intrusives, particularly the aplitic phases. In fact, the two can often be difficult to distinguish. This is strongly suggestive of a magmatically driven hydrothermal system and is discussed in more detail below. Alteration selvedges on veins are non existent or entirely destroyed by later saprolitization. Quartz vein density does not seem to correlate well with degree of hydrothermal alteration of the granites – it some cases they tend to be on the periphery.

DISCUSSION

The Paleoproterozoic gold mineralization on the Carneirhino Property is related to a high level magmatically driven system characterized by low sulphide Au-bearing oxidized fluids which formed structurally controlled extension-style quartz veins and linear fault/contact controlled alteration zones in a post orogenic setting. The known mineralized zones in the Carneirhino area are largely controlled by a NE trending fault, however, the orientations of mineralized quartz veins in several areas indicate secondary structures are also important.

A number of Au in soil anomalies identified in 2006 correspond with magnetic lows. Only those on the western part of the Property were investigated this year. The large SW

anomaly is caused by shallowly dipping sedimentary rocks, while the remaining few failed to produce outcrop. However, boulders in the area suggest these anomalies may be underlain by the late-stage fine-medium grained granitoids. If this is the case, than there may be potential for intrusion hosted or porphyry Au deposits as there is a good correlation spatially between the late intrusives and Au (e.g. Antonio De Luca #1, Antonio Josa, Claudomere #1&2).

Based on airphoto/landsat interpretation, other geologists have suggested the presence of small round dome shaped structures on the property. The author has not been able to verify this, however, the Camp area does appear to form a somewhat elongate topographic high. The Camp area is tentatively interpreted as a late stage felsic dome based on:

1) The felsic (near monomineralic quartz) two-stage cooling (porphyritic) "pod" seen near camp. Vuggy textures in this unit indicate a volatile-rich viscous crystal mush with high brecciation potential.
2) Flanking breccias next to this pod, on the airstrip and north of camp at the bottom of the hill may correspond to the felsic domes carapace breccia.
3) Boulders of silicified and variably hematitic breccias just south of camp. This is not seen in any abundance elsewhere on the property. They may also correspond to a silicified version of the domes carapace breccia.
4) Flanking silicious laminates to the south may indicate venting of the felsic dome.
5) The morphology of the Camp area is suggestive of a dome structure.

There is no reason to believe that there is any mineralization associated with this unit, however, a couple of drillholes would help to resolve this – one at the quartz pod and another at the south end of the airstrip.

While the Carneirhino Property does show similarities with intrusion hosted/related systems ((sub) alkaline host rock, high level textures, Au with weak to no base metals, localized alteration, Maloquinha Sn showings, low sulphide contents, structural control) there are some differences (oxidized fluids, lack of carbonate alteration? tectonic setting?). It should be noted, however, that carbonate has been reported in some abundance on the Carneirhino trend (in drillcore?); presumably any carbonate that was present at the surface was quickly removed during saprolitization.

At this point, the following can be concluded with some confidence:

1) Mineralization on the Carneirhino trend is directly related to a NE striking fault which appears to trend from at least the Antonio De Luca #1 to NE of Antonio De Luca #2. This structure presumably acted as a fluid conduit resulting in the adjacent alteration and mineralization.
2) Vein textures, host rock age, structural characteristics and relative timing of mineralization all suggest a high level mineralization episode in a post orogenic setting.

3) Mineralization is of the low sulphide variety and is related to an oxidized fluid system. Alteration associated with veining is minimal, while alteration adjacent to the fault is quite strong.
4) There is a spatial association between the fine-medium grained granitoids and Au mineralization.
5) The evidence points toward a deposit type with similarities to intrusion hosted systems as seen in the Tintina Gold Belt and elsewhere.

R. Therriault, M.Sc.
APEX Geoscience

APPENDIX A: PHOTOS

1:Heavily fractured fine-medium grained (chill?) Maloquinha syenite with small wallrock clasts near margin of intrusion?
2: Ladder veins (Type 1, 2 and 3) in Antonio De Luca Pit #1.
3: Antonio De Luca Pit #1.
4: Antonio De Luca Pit #1.
5: Xenolith of coarse grained syenogranite in fine-medium grained granitoid, Antonio De Luca Pit #1.
6: Aplitic dykes and variably dipping fracture cleavage. Claudomere Pit #2.
7: Aplitic dykes and variably dipping fracture cleavage. Claudomere Pit #2.
8: Contact between coarse and fine-medium grained fault/faulted dyke. Antonio De Luca Pit #2.
9: Subtle Z-fold at contact between coarse granite and fault/faulted dyke, Antonio De Luca Pit #2.
10: Subtle Z-fold at contact between coarse granite and fault/faulted dyke, Antonio De Luca Pit #2.
11: Fault/faulted dyke cutting coarse Maloquina granite, Antonio De Luca Pit #2.
12: S-fabric (dextral) in small shear, NW Carneirinho trend.
13: Same shear as above, clay veins after K-spar?
14: Torr/core stone.
15: Magmatic? fabric in coarse granites, NW Carneirinho Trend.
16: Magmatic? fabric in coarse granites, NW Carneirinho Trend.
17: Marginal breccia to felsite intrusive, trail just north of camp.
18: Marginal breccia to felsite intrusive, trail just north of camp.
19: Finger of intrusive in related breccia, trail just north of camp.
20: Sphalerite vein from Antonio De Luca pit #2.
21: Dyke/structure related to strong gold mineralization at Claudomere pit #1.
22: Poorly bedded sandstones on SW magnetic low.
23: Mudstone clasts in fine-medium grained granite at Claudomere pit #1.
24: Bulbous “stromatolitic” silicious laminates from drainage south of camp.

APPENDIX B: HAND SAMPLE SUITE

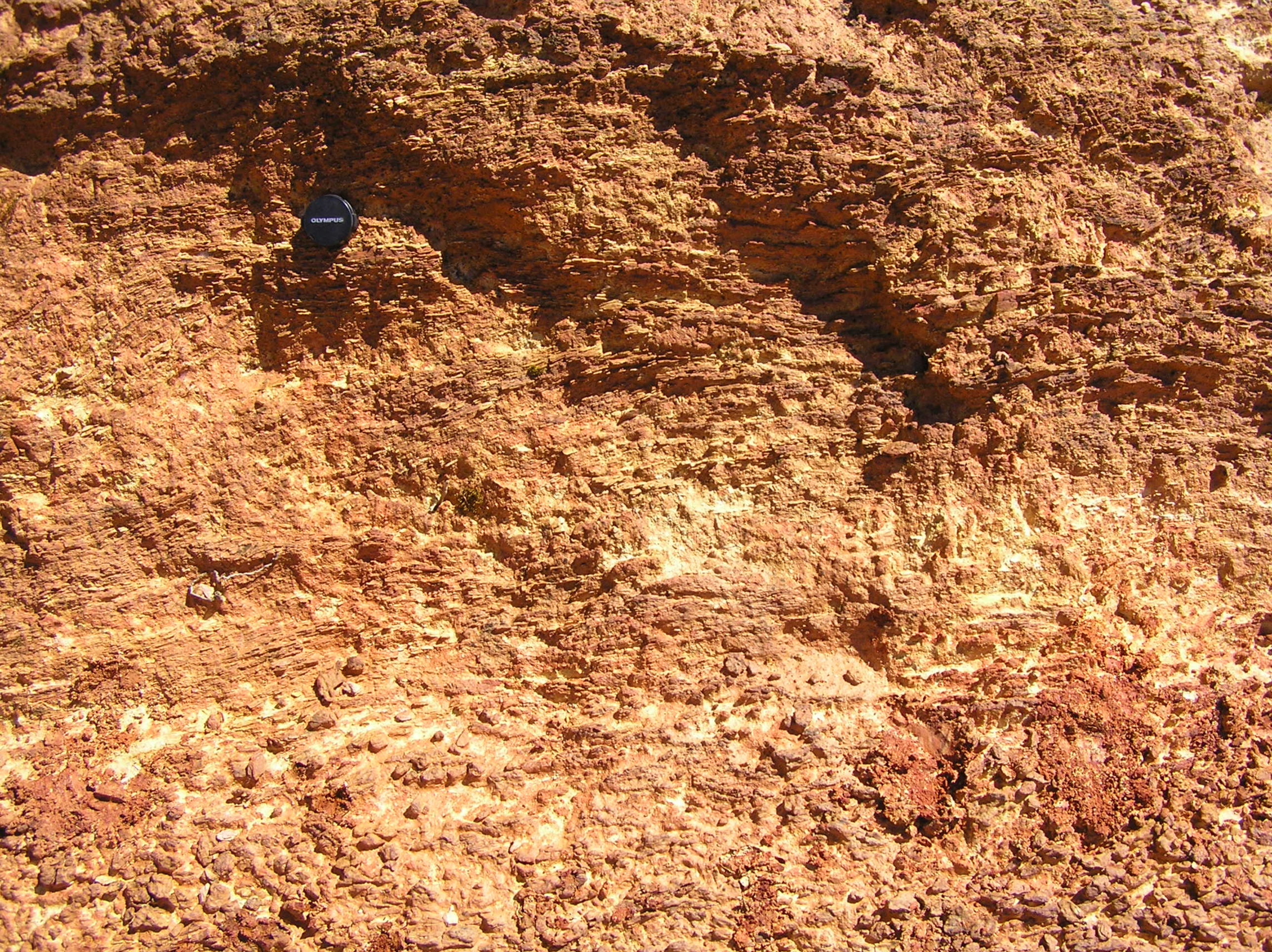
RTP002: Pyritic rosy coloured qv with 2-3% pyrite, Grid A drainage.
RTP010 Bt-K-plg-qrtz +/- chl-ep, minor amphibole. Chl-ep ovp mafics but mafics mostly in good shape.
RTP011: Same as 010, dull amphibole, pearly bt.
RTa: Fresh qrtz syenite, bt-amp. Plag poor.
RTb: Qrtz syenite, qrtz> than previous sample. Coarse and plag poor. Bt-amp.
RTc Coarse qrtz syenite/syenite. 1% py with mafics.
RTP012: K-metasomatized gab/hypabyssal with 0.5% pyrite. Magnetic.
RTd: Fine grained recrystallized sy/qrtz sy o/c. May be chilled margin on Maloquinha intrusion. Abundant fracturing, small wall rock clasts.
Rte: Hand sized chunk of laterite from Carn garimpo area.
RTf: Felsic dyke from SW most garimpo. Very silicious.
RTg: Cherty argillite/mudstone from SW most garimpo.
RTh: Felsic dyke/stock? With feldspar or quartz pheno. Possible sandstone? SW mag low.
RTi: Vein and tectonic bx overprinting and recrystallizing Maloquinha?
RTj: Recrystallized silicified Maloquinha cut by qrtz or K veins.
RTP028: Felsic? boulder found on mag low to SW. In drainage, similar to dykes seen in SW pit to the north. Possible sandstone.
RTk: Fresh granite from NW part of garimpo area. Qrtz-kspar-plg-amp-bt.
RTl: Occurs as a dyke in the coarse granite in the NW part of the garimpo area. May be the host to the qv seen in the active garimpo.
RTM: Sheet of fine grained intrusive in garimpo trend.
RTo: Samples from drainage SW of camp. Cherty silicious laminates.
RTp: Antonio Josa – hem and qrtz veins ovp granitoid?
RTq: Camp felsite dome and bx north and south of camp.
RTr: Sedimentary rocks from SW drainage.
RTs: Qrtz diorite/gd east of Manoelgancho.
RTt: Fine-med granite, east of Manoelgancho.
RTu: Manoelgancho garimpo.
RTv: Meander showing qvs, possible sphalerite. Coarse.
RTw: Py minz qv, Grid A drainage.


OLYMPUS


OLYMPUS


07BAP015


07BAP015


OLYMPUS


OLYMPUS


OLYMPUS


OLYMPUS


OLYMPUS


OLYMPUS