GEOLOGY OF THE LA INDIA GOLD PROJECT, NICARAGUA

June 2016

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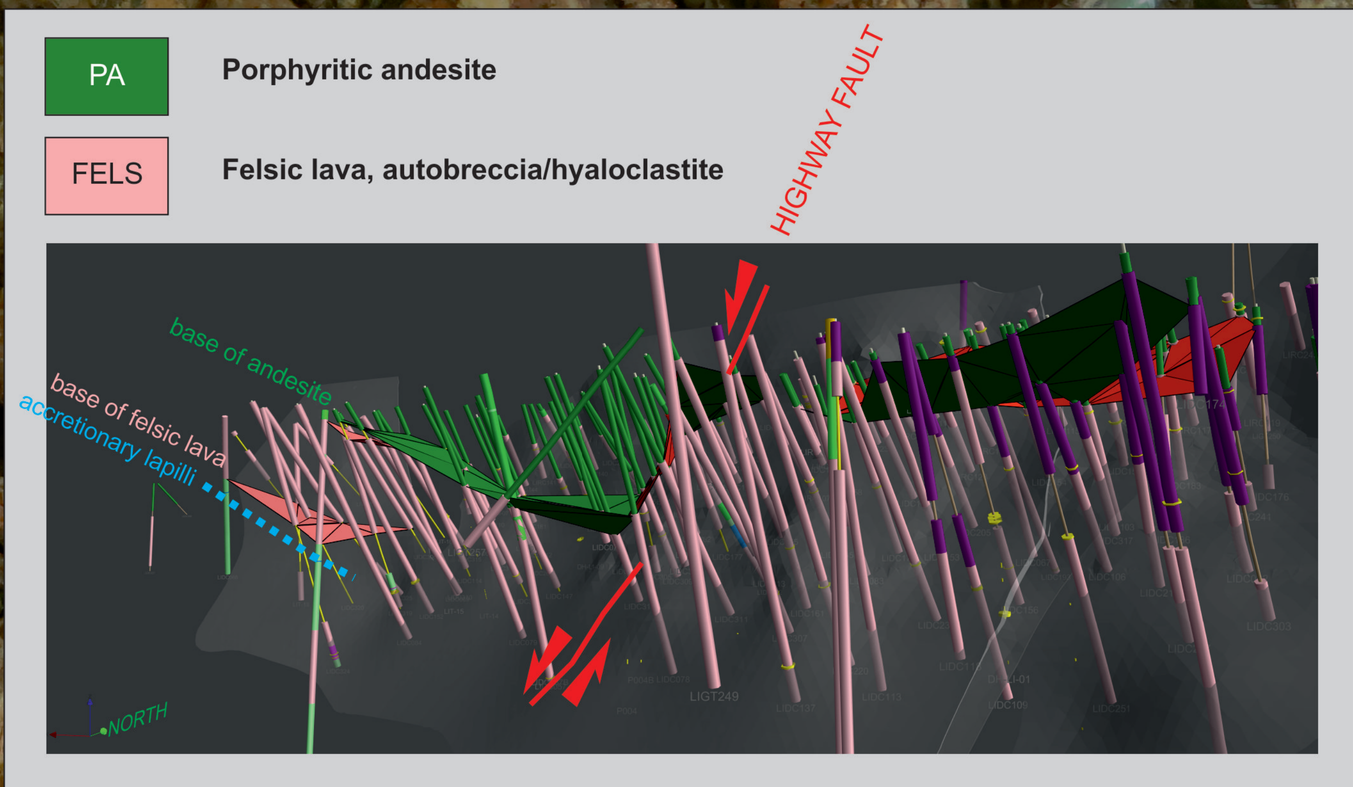

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1 EXECUTIVE SUMMARY

The La India gold project, Nicaragua, was visited from the 1st to the 14th June 2016, in the company of Miguel Ponce. Mark Child (Condor Gold plc) commissioned the work. The objective was to begin a mapping program and install procedures for future mapping.

The Tertiary volcanic sequence is typical of a maar volcano and felsic dome district, with swampy or lacustrine conditions. Many of the felsic flows may have been erupted into water, explaining widespread hyaloclastite. Many low sulfidation epithermal deposits are associated with similar volcanic rocks e.g Kupol, Russia. Some very siliceous felsic rocks, with common patches of quartz and chalcedony, occur a long way from the principal veins. This silica is probably diagenetic, not a vector towards mineralization. It masks the true chemical composition of the lava, which resembles rhyolite, whereas the inner parts of the flows are clearly dacite or dacitic andesite. There is evidence (cognate xenoliths) of magma mixing, with simultaneous eruption of two distinct chambers. I would expect that these felsic flows/dome, and the voluminous welded tuffs (ignimbrites), issued from a caldera. Its location is unclear. Many epithermal deposits show a relation to a caldera, commonly occurring on the border.

There was a distinct lack of interaction between hydrothermal fluids and wall rocks; igneous magnetite is commonly retained. Some alteration is distinctly alkaline (with adularia, calcite, chlorite, epidote). There is almost a complete lack of sulphides in wall rocks and veins. This is very good news for future acid mine drainage, but bad news for geophysical methods that rely on the electrical properties of disseminated sulphides. It also means that Terraspec (SWIR) analysis is not going to work well and may not be cost effective.

At La India very good gold grades occur over a large vertical elevation; strong bladed calcite textures indicate boiling over this wide interval. It seems that the boiling interval is great precisely because the wall rocks were 'tight' and relatively impermeable. Fluids were thus confined to an open conduit, in hydraulic contact (?) with the surface and/or surface water (a lake?). Variations in the water table, or pressure/temperature conditions caused by choking (cementing by minerals) of the conduit close to surface, caused pronounced variation in the boiling level.

Gold oreshoots at La India seem to plunge moderately steeply southeast. They are probably related to structural intersections and jogs in fault systems (with dextral offset); these provided improved connectivity for fluid flow. Certain rock types (e.g. felsic lavas) made excellent hosts for veining. More 3D modelling is required to establish, or discount, this. I suggest that there will be an area of poorly developed veining to the SE of La India, coinciding with waterlain tuffs. However, veins should improve farther SE as more competent felsic lavas again approach the surface. Mapping is required urgently in that direction. Step-out drilling may be disappointing, unless planned carefully to target the right host rocks.

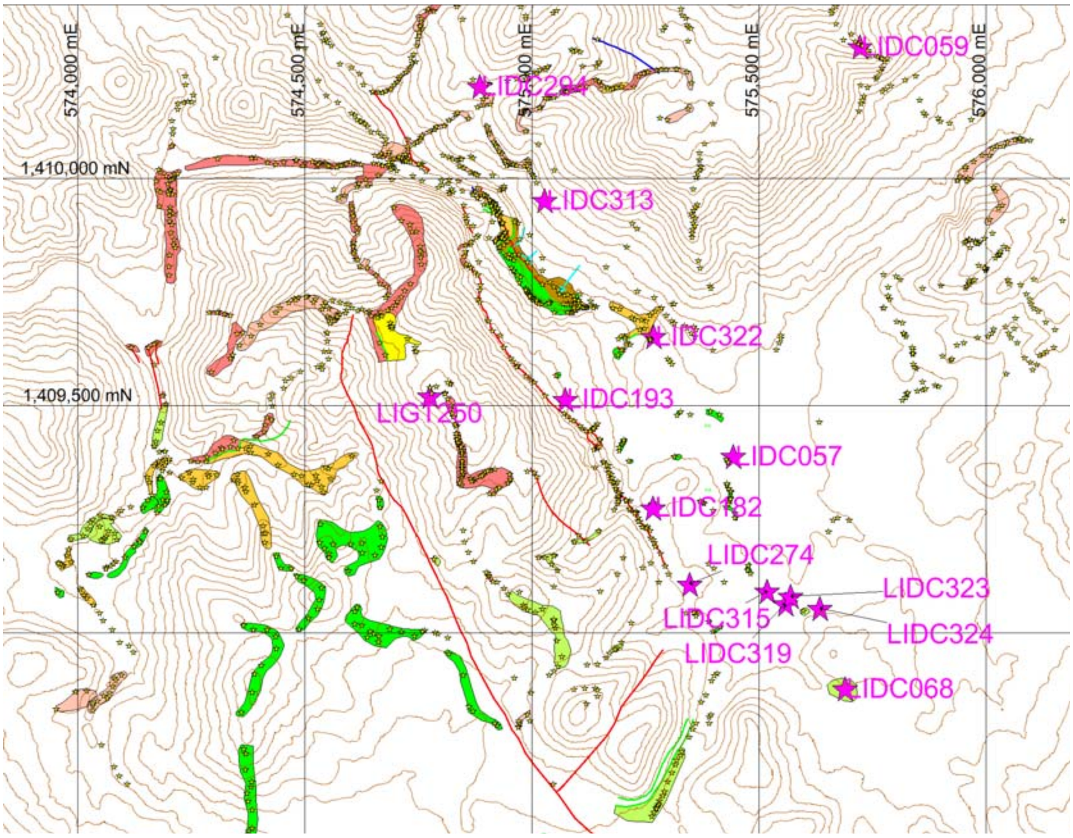
The main deliverables are: 1) a packaged Mapinfo Discover workspace with a geological map of La India. 2) Appendix of drill logs, with photographs of typical textures.

Recommendations are made.

2 FIELD SCHEDULE, OBJECTIVES & DELIVERABLES

The author visited La India with Miguel Ponce from the 1-13th June 2016. This was at the request, and in the company of, Mark Child (Executive Chairman, Condor Gold plc). The Rio Luna property was visited briefly during demobilization to Managua on the 14th June. The morning of the 15th June was spent compiling information and scanning drill logs.

The main objective was to initiate a new mapping program, train the geologists on site, and ensure that a system is in place for continued mapping. The main thrust was to make sure that every geological observation has an xyz coordinate and can be imported easily into Mapinfo or any other GIS. Mapping was carried out every day in the company of Carlos Pullinger, joined on some days by the other geologists (Armando Tercero, Christian, Bayardo) and Armando Tercero (Jr). Observations are shown with yellow stars below; logged holes are shown in purple.



Heavy rain meant that core logging was more productive in the afternoons. Nearly 3000 m of core were logged (Appendix 2). The logging is in the graphic log style, recommended by McPhie et al (1993). Assays are included and alteration minerals are shown as qualitative percentages on the right hand side. Angles (the angle between structure and core axis) of primary structures (bedding, flow foliation, welding fabric) are shown on the left side; secondary structures (faults, veins) on the right.

Deliverables. The main deliverable is a packaged Mapinfo Discover workspace with detailed mapping. Figure 1 is a simplified version. The Mapinfo tables have logical names, such as 'WP_andesite.tab'. I have tried to use similar colours to my lithological logging scheme. The Mapinfo/Discover workspace was constructed using the WGS 1984 (Zone 16N) UTM projection. Some of the 3D concepts are best explained in videos (Appendix 6).

The map should not be considered as a 'final product' or static. Instead it is a snapshot. It will evolve. Inevitable mistakes will be corrected, as mapping and core logging by Condor Gold geologists is integrated. The detailed mapping of veins by Condor Gold, the work of many man-months or years, is in many ways superior and this information needs to be integrated into the map. Our focus was on the bigger picture; volcanic stratigraphy and major faults.

Notes. All observations and structural measurements, uncorrected for magnetic declination, are georeferenced and included in a spreadsheet (Appendix 1). Coordinates are given for all 'WP' localities (referred to in the text of this report and in the figures). Probably the most important column is the 'Notes' column, which includes all field observations. Spheristat software was used to analyse the structural data and make stereograms.

Compass directions are abbreviated to N, S, SE etc.

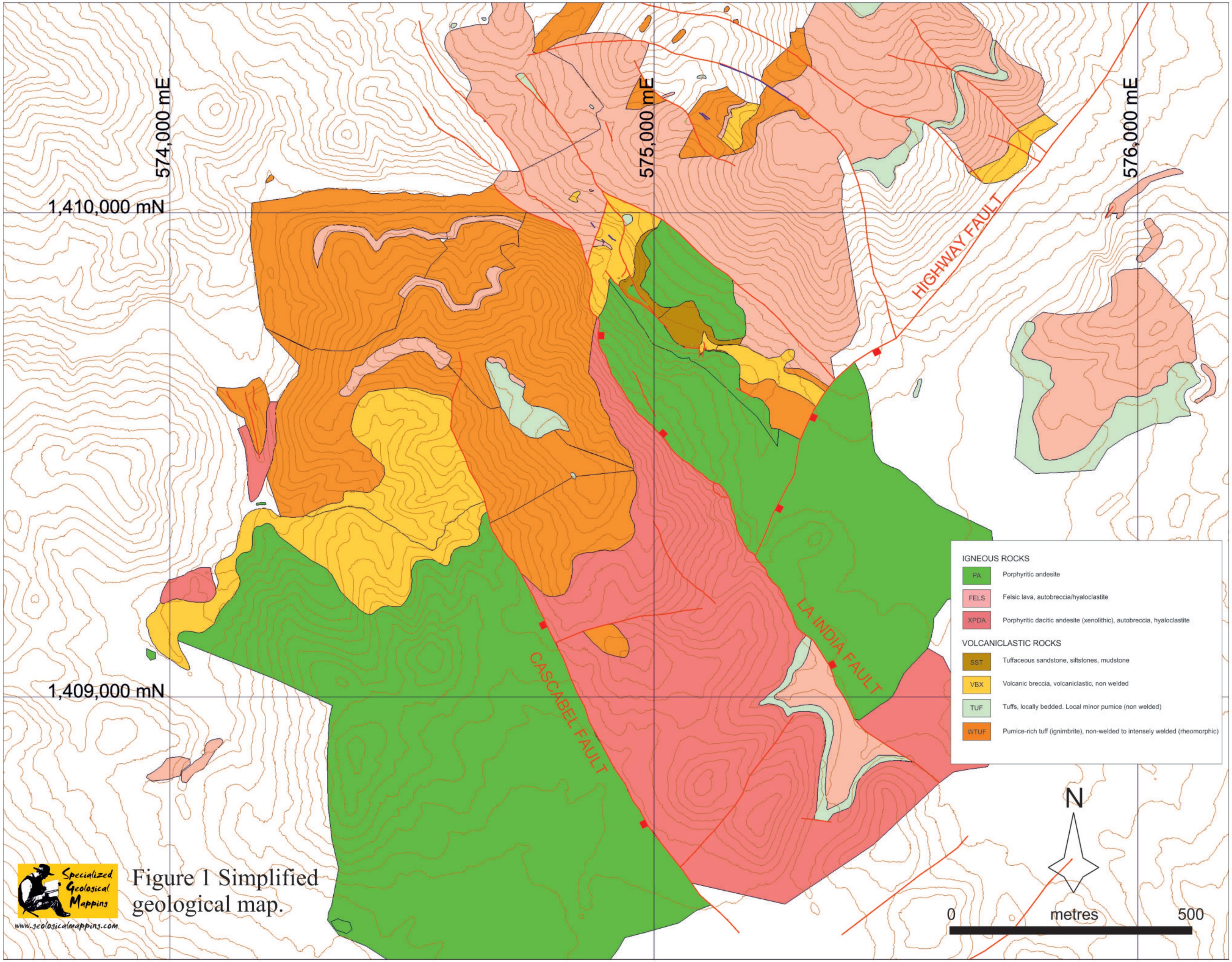


Figure 1 Simplified geological map.

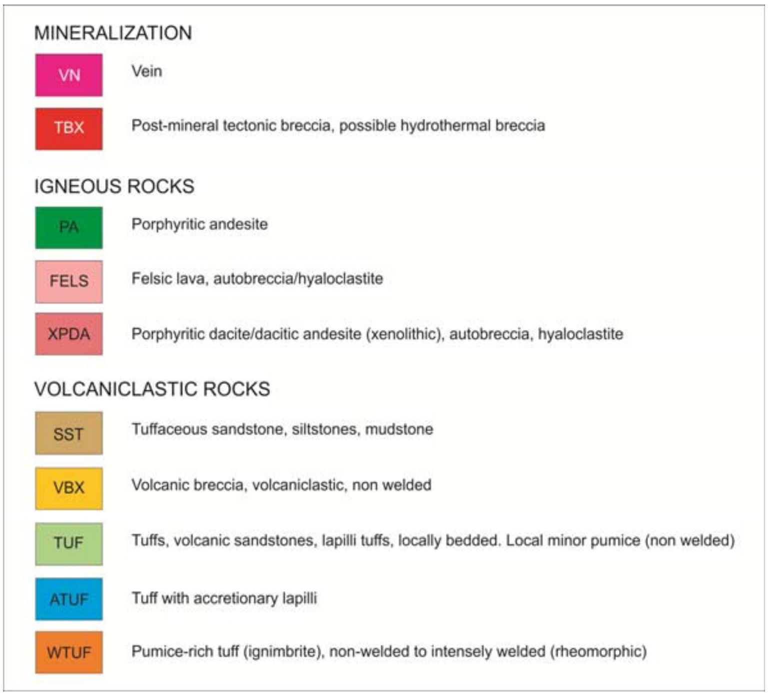
3 LITHOSTRATIGRAPHY

La India is hosted by Tertiary volcanic rocks. Some are coherent lava flows; others are pyroclastic. Some were remobilized and resedimented after eruption. These latter rocks are trickier to name; I recommend following McPhie et al (1993) (Appendices 3-5).

The principal rock types are:

1) Porphyritic andesite
2) Felsic lava
3) Tuffs
4) Resedimented volcanic rocks

The map and log colour scheme and lithology codes are shown in the graphic below.



The principal characteristics of each are:

Porphyritic andesite (lithology code PA). These are the youngest rocks at La India. At least two discrete lavas (or sills) are present in LIDC 57 in the hanging wall of the La India vein (Appendix 2). The upper is reddish, with moderately isolated feldspar phenocrysts (0.5-2 mm long) and scattered small chlorite-altered mafic phenocrysts (probably clinopyroxene?). The groundmass has distinctive red, hematitic partings which define a weak flow foliation. The flow is amygdaloidal at the base. The rock is moderately magnetic.

The lower flow (or sill) is a darker olive green and richer in mafic phenocrysts. The groundmass is slightly granular. The top is amygdaloidal, with calcite and chlorite amygdales. The rock is moderately magnetic.

Amygdaloidal andesite forms distinctive red soil. Exposures of red amygdaloidal andesite, surrounded by these red soils, occur on the SW side of the Cascabel Fault. It is unclear how andesites on the SW side of the La India 'horst' correlate with those on the NE side.

Felsic lava (FELS, XPDA). This is an important, widespread rock type at surface and in drill core. There are numerous exposures of white/cream-weathering flow foliated and siliceous autobreccia and hyaloclastite (Figures 2 & 3). It tends to form cliffs and creek exposures. An excellent example occurs around the antenna to the northeast of the town [576000 1409773]. This rock has been described, probably because of the high silica content. as 'rhyolite' or 'rhyolite domes'. Future 3D modelling may define a true dome, but there is little evidence; instead the units seem to be flows or sills.

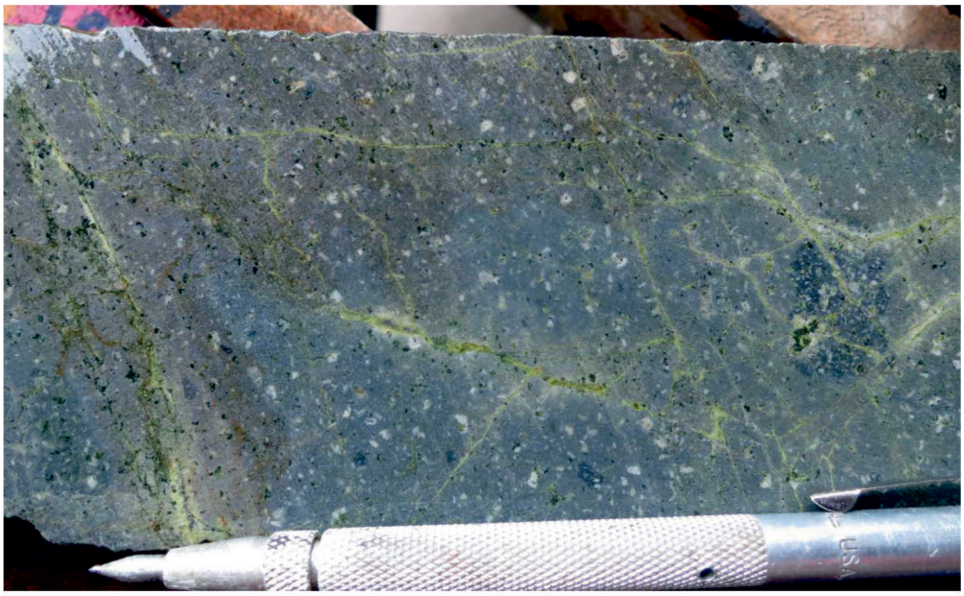
Drill core shows clearly that these felsic lavas are strongly zoned; colour and silica content are very variable. The top is commonly white, siliceous, autobrecciated and flow foliated. Patches of drusy quartz and chalcedony are common. This grades down into pink, and then reddish grey, glassy lava with isolated small feldspar phenocrysts (0.5-2 mm). Glomeroporphyritic texture is widespread. Locally the rock is green because of epidote alteration (Figure 2). This rock may be dacitic, or even dacitic andesite. Given the uncertainties, I use the lithology code 'FELS' ('felsic lava'). Siliceous autobreccia generally reappears at the base of the units, locally with peperitic fingers of sedimentary rock. Perlitic and spherulitic texture is widespread, indicating that these were probably very glassy rocks. The spherulites locally reach > 0.1 m in diameter (Figure 2). In one drill hole (LIDC 193 @ 217.5 m) unusual 'pumice fiamme' seem to occur within the felsic lava.

It is not clear if the felsic rocks are true lava flows or cryptodomes/sills, intruded at a very high level into wet volcaniclastics or sediments. I refer to them as 'lavas' because they have a tabular shape, but evidence is not conclusive.

The local high silica content of the felsic lavas either reflects: 1) introduction of diagenetic silica or 2) hydrothermal fluids travelling laterally along more permeable autobreccia. The first occurs frequently in the carapace of flows and domes, which suffer considerable action by steam and hot fluid as they cool. Silica is frequently deposited in these environments. It is notable that some very siliceous felsic rocks, with common patches of quartz and chalcedony, occur a long way from the La India vein conduit. This implies most silica is early diagenetic and not a vector towards mineralization.

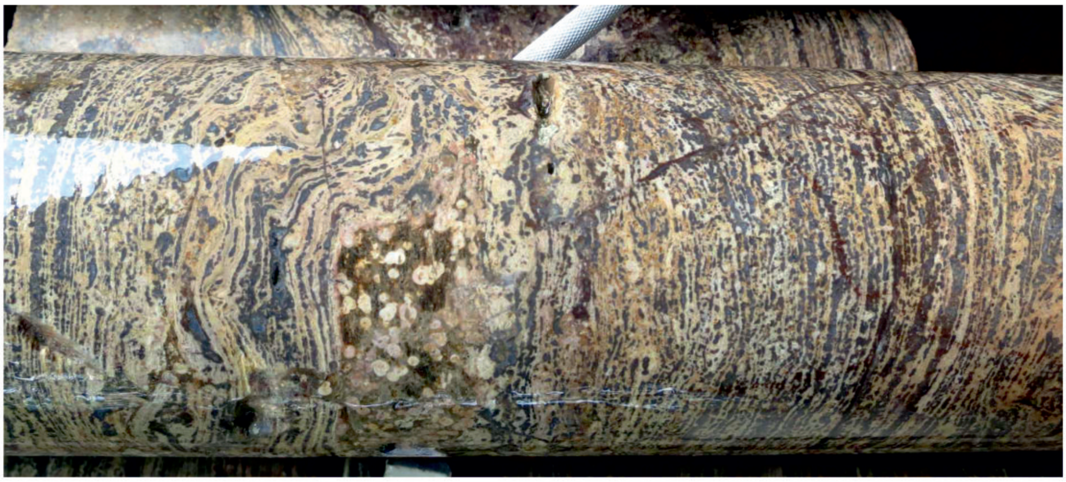
Several of these felsic lavas have very distinctive dark, more mafic cognate xenoliths, some with very intricate, sinuous contacts. (These xenoliths were described in a Newmont petrography report.) They are the product of magma mixing, with two chambers contributing lava. Several drill holes (e.g. LIDC 323) display several discrete flows with xenoliths; this indicates that there is not one single marker. This distinctive rock was mapped widely in the field and is therefore separated from the other felsic lavas, with a separate lithology code (XPDA). It is probably the most important unit for 3D modelling and mapping. In some cases, in strongly oxidised rock, where the xenoliths are not obvious, I may have coded XPDA as FELS.

The vertical zonation apparent in drill holes is probably also present laterally. Felsic (dacite-rhyolite) lavas tend not to flow many kilometres beyond their vents because they are viscous. They frequently show lateral transition into hyaloclastite (if erupted into water), then hyalotuff (transported hyaloclastite). A typical transition is shown below (modified from McPhie, 1993).



LEFT. LIDC 323 @ 280 m Porphyritic dacite or dacitic andesite with isolated feldspar phenocrysts (glomeroporphyritic) and abundant disseminated and veinlet epidote.

RIGHT. LIDC 323 @ 94 m Strongly flow foliated, siliceous 'rhyolite'. Originally glassy, now with abundant small spherulites.



LEFT. LIDC 323 @ 136.4 m Very large spherulite overprints perlitic glass (felsic lava).

RIGHT. LIDC 57 @ 158 m Porphyritic daciitc andesite with mafic xenoliths (XPDA).

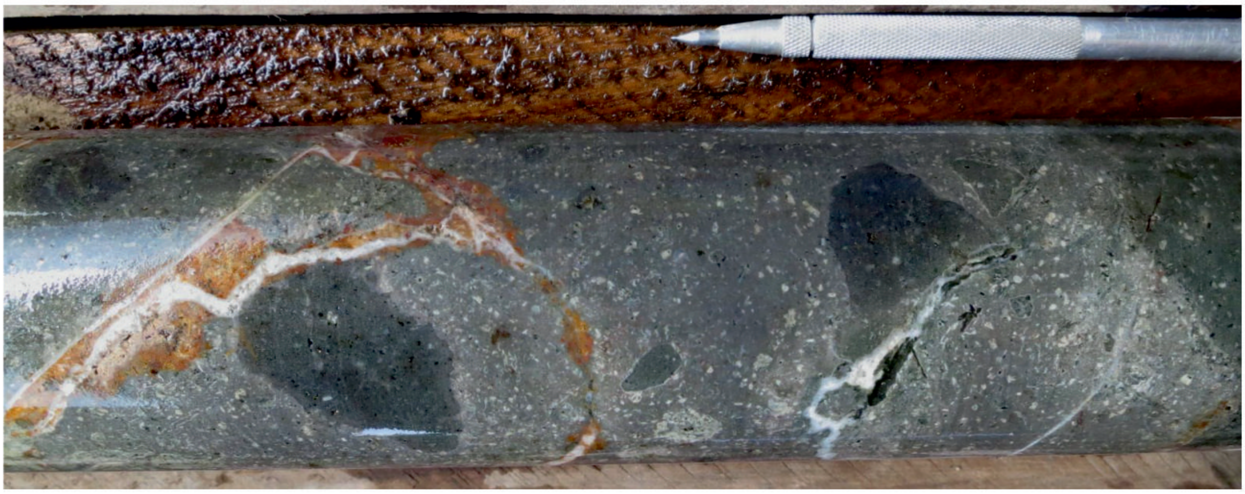


Figure 2 Examples of textures in felsic lavas. Drill core.

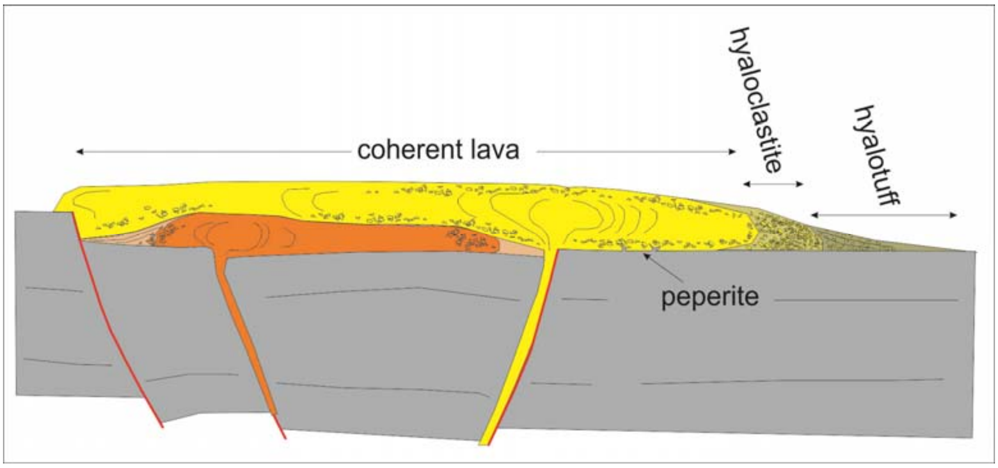
RIGHT. WP 1205. Felsic autobreccia, siliceous, with flow foliated clasts up to several metres in diameter.

BELOW. WP 595. Felsic hyaloclastite.

RIGHT. WP 559. Spherulitic, flow banded felsic lava. Siliceous.

RIGHT. WP 921. Transported felsic breccia. Clasts are up to 1 m in diameter. Mostly monomict felsic lava clasts.

Figure 3 Examples of textures in felsic lavas. Field examples.

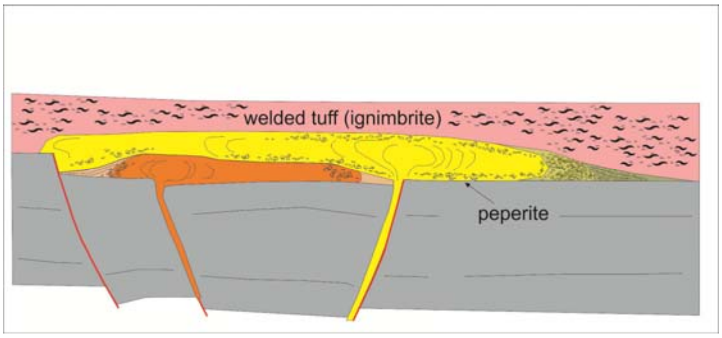


Hyaloclastite, formed by the explosive cooling of lava in water, is very widespread at La India, so there is plenty of evidence of eruption into water (a lake?).

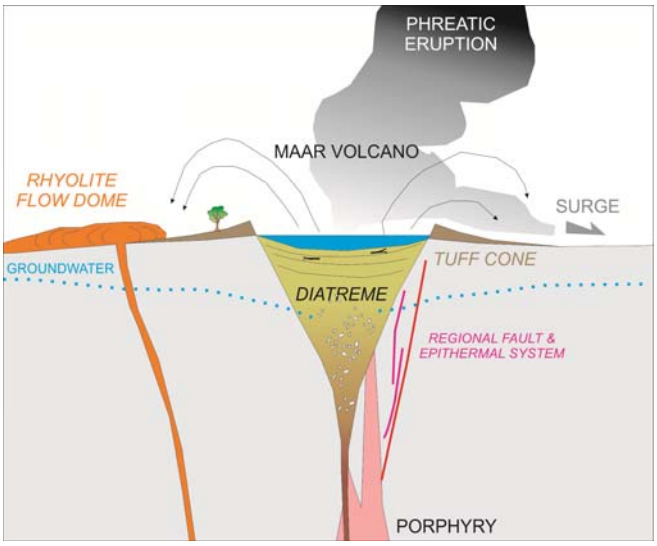
Tuffs. There is a great variety of tuffs at La India, but they fall into two main types: 1) massive, welded pyroclastic flow deposits dominated by pumice; 2) softer air fall or water lain tuffs, mostly light green, with rare accretionary lapilli.

1) *Welded pumice-rich tuffs.* These vary from ultra-welded tuffs, which resemble flow banded rhyolite, with rheomorphic folding (exposed at [574900 1409125]) (see photograph below; also upper part of LIDC 322), to weakly welded tuffs. These rocks have a glassy matrix (former ash) with common broken feldspar crystals + lithic lapilli + pumices. Eutaxitic texture, with flattened glass shards, is visible rarely. These glassy rocks display the same kind of devitrification features as the glassy felsic lavas: spherulites, perlitic texture.

Moderately, to strongly welded tuffs with abundant pumice fiamme are widespread, particularly in the footwall of the La India structure. Examples are shown in Figure 4. But it is clear from logging that individual tuff units show much variation in welding intensity. It is also likely that, because the tuffs fill in valleys (see sketch below), they vary in thickness and intensity of welding in different parts of the unit. Many of the lapilli are very similar to the felsic lavas. This suggests that the pyroclastic flows developed by collapse of felsic flows and/or domes. Some of the tuffs display cross-cutting 'dykes' of winnowed, clast-supported lapilli; these are probably the result of degassing and steam explosions in the cooling tuff. They can be mistaken for 'inter-beds' of lapilli tuff.

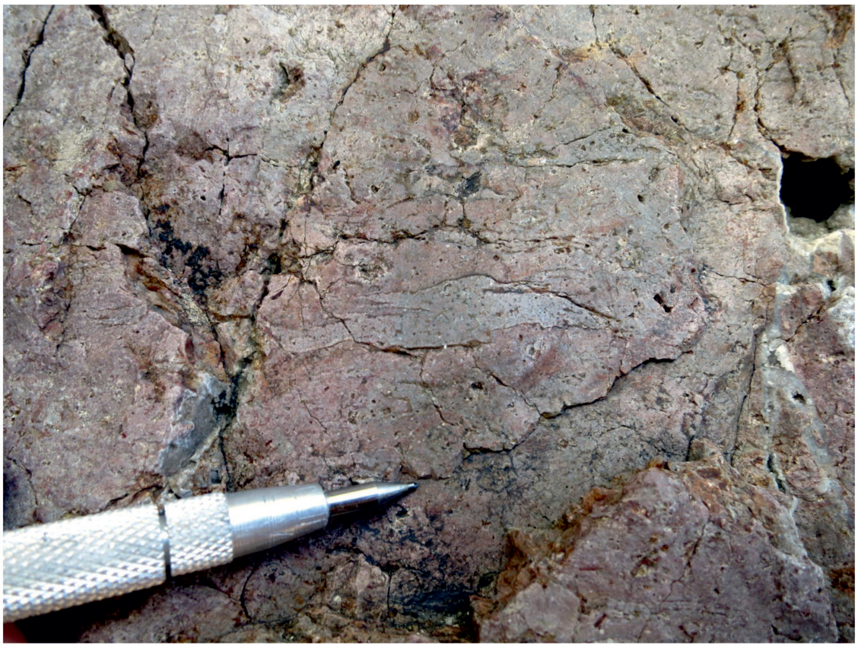


2) The air fall and water lain tuffs are light green, much finer grained and show crude bedding. In some places, they are clearly water lain, thinly bedded, with graded bedding. Rarely, they are rich in organic material and approach 'coal'. Accretionary lapilli, which appear transported and broken, are an indication of a high water table and 'wet' conditions during volcanism (Figure 5). They tend to be associated swampy conditions, maar volcanoes and crater lakes. They are caused by phreatic/phreatomagmatic eruptions (interaction of cold water with hot rock) and pyroclastic surges (see sketch below). The green tuffs were not seen on surface, except in some poorly accessible road exposures SW of La India [575354 1408787]. They occur mostly in the SE of the La India structure, in LIDC 68, 182 and 323.



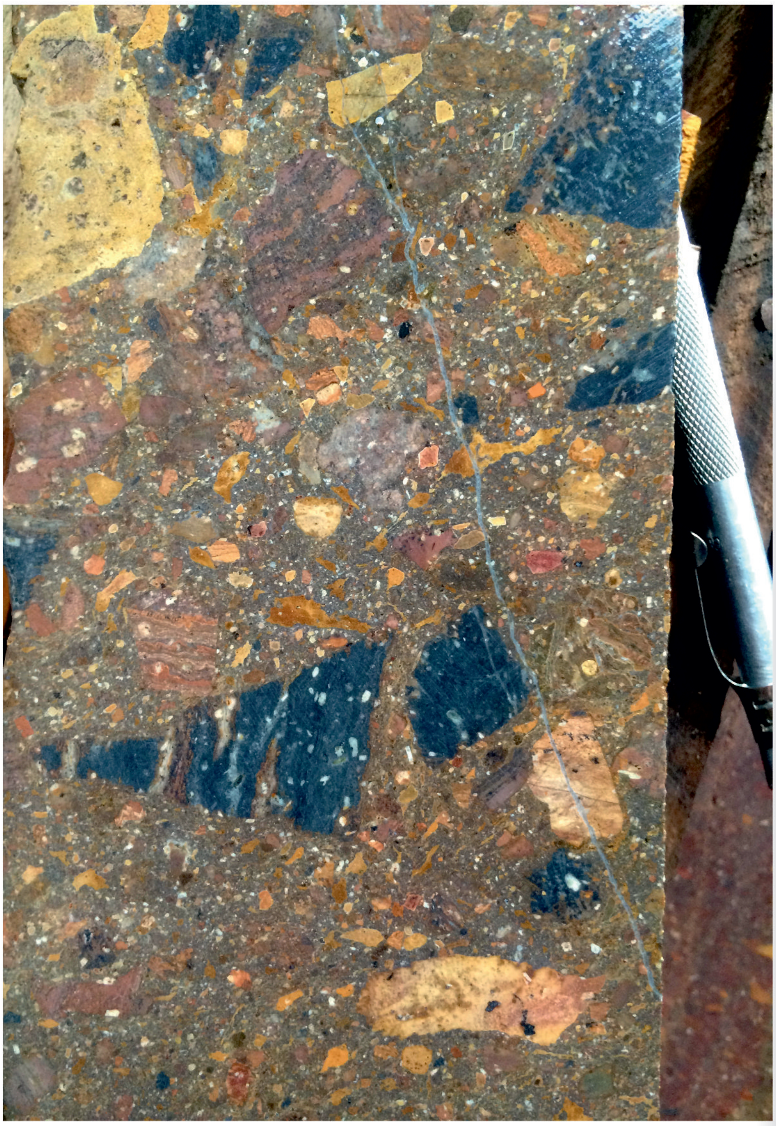
Other rocks. There is an assortment of resedimented lava and pyroclastic rocks. These can be difficult to classify or shoehorn into one particular lithology code. At one extreme these include well bedded and graded tuffaceous sandstones (lithology code SST), conglomerates, clearly deposited from currents (e.g. Figure 5). At the other extreme are coarse volcanic breccias that comprise almost monomict felsic lava clasts, with the occasional large pumice.

There is clear evidence that felsic flows or domes collapsed and were transported as mass flows, with boulders up to metre size. This means that in some drill holes the distal expression of a coherent felsic lava flow/sill may be a transported breccia (lithology code VBX). Such a



LEFT. WP 142 Large pumice fiamme with classic ‘swallow tail’ reentrants. Moderately welded tuff.

BELOW. WP 1482 More andesitic (?) lapilli tuff with large pumices or juvenile fragments. Weakly welded?



ABOVE. LIDC 313 @ 170 m Non welded tuff with mix of lithic lapilli (felsic lava) and pumices (yellowish).

RIGHT. LIDC 313 @ 140 m Welded tuff with common large pumice fiamme. note contrast between weathered and non-weathered colours.

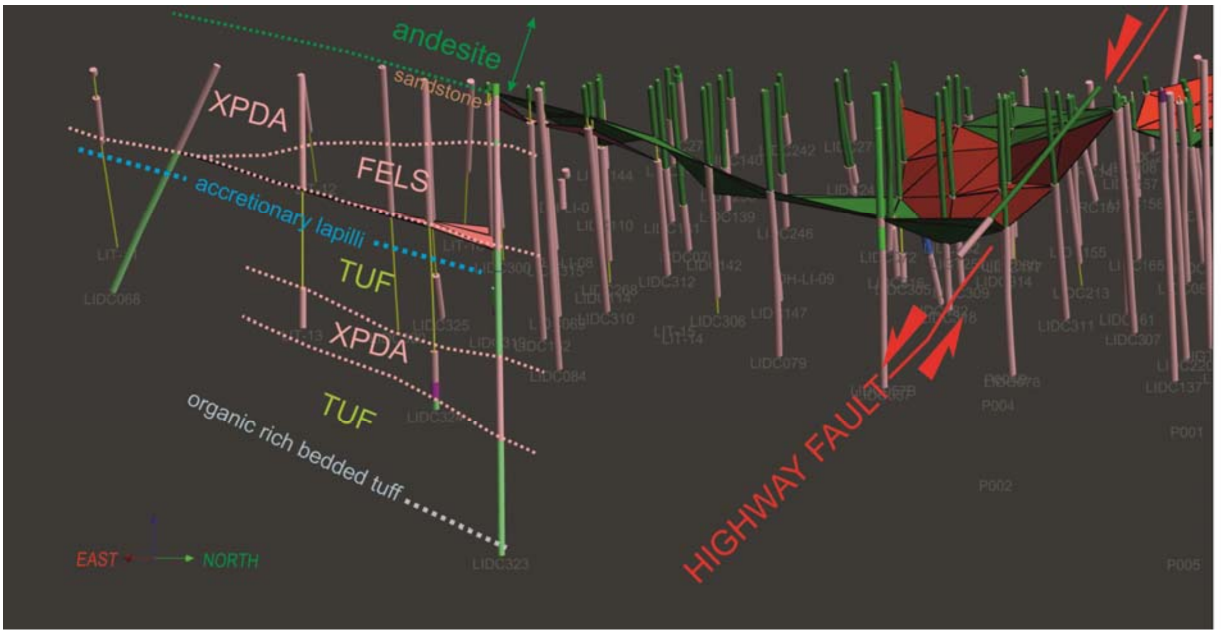
Specialized Geological Mapping

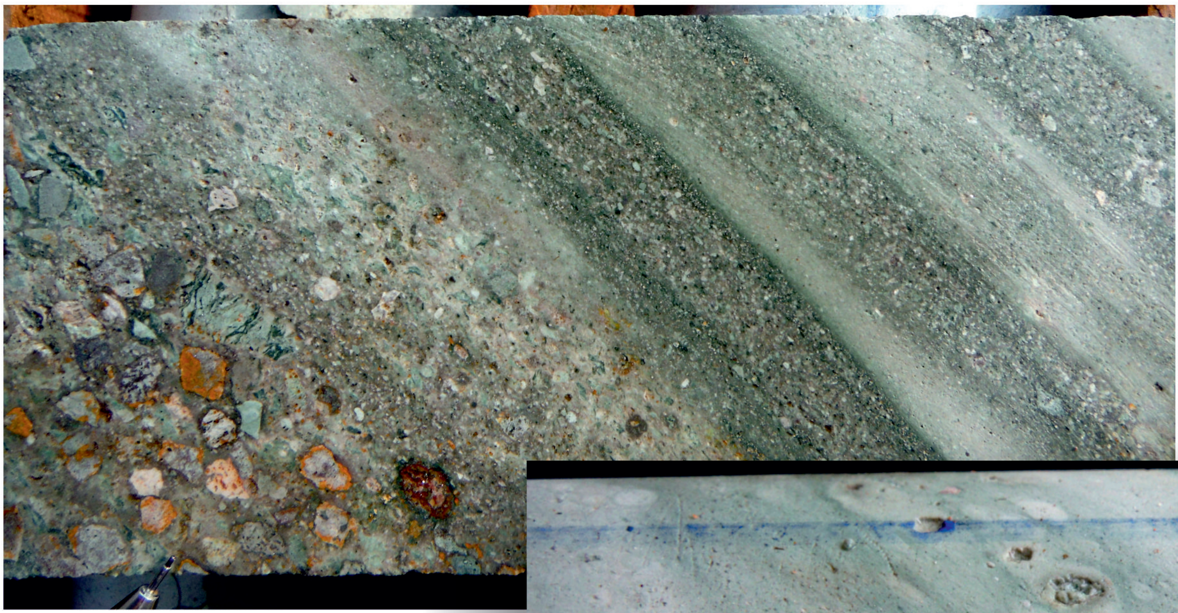
Figure 4 Examples of pumice-rich tuffs.

breccia is exposed in the creek below the La India structure, immediately beneath coarse sandstones (WP 290 and WP 292 in Figure 5). An example from the W of the mapping area (WP 1045) is shown below; the bright green clasts are smectite-altered.

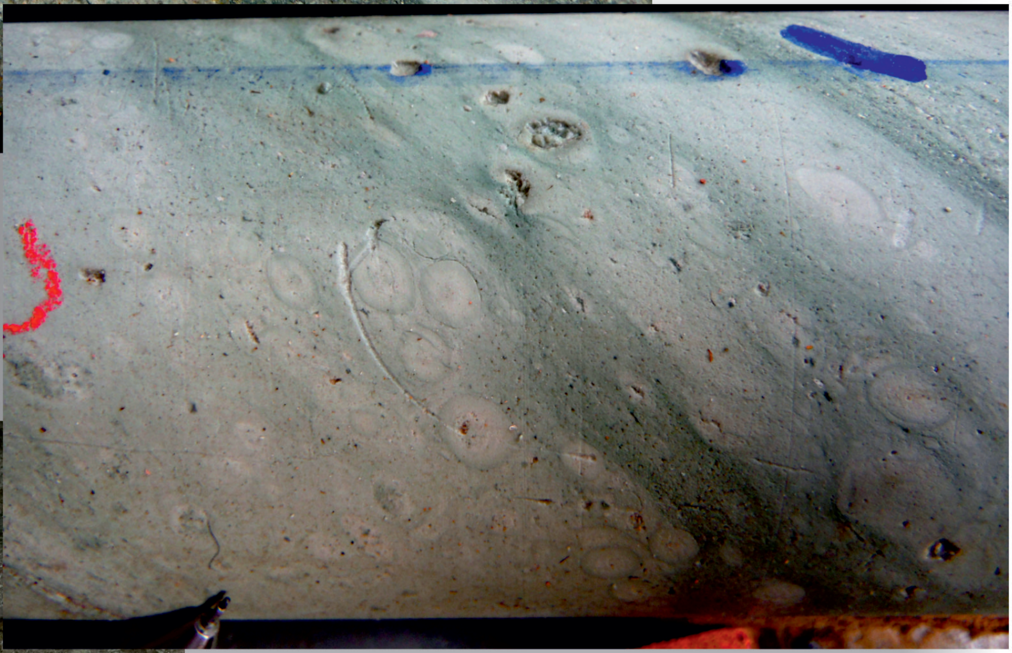
Lithostratigraphy. It is early days in terms of a complete lithostratigraphical column. There are some big questions regarding the stratigraphy on either side of the Highway Fault.

The East side of the Highway Fault seems simpler, as shown below. Logging of LIDC 323 and 068 during this visit showed excellent marker beds, in particular tuffs with accretionary lapilli (blue in screenshot below). There are two XPDA (xenolithic felsic lava) units; the lower is thinner, the upper has a more complex geometry and appears to be replaced northward by another felsic lava flow or dome (FELS in screenshot below). The lower part of the stratigraphy comprises mostly non-welded fine grained lapilli and crystal tuffs, locally bedded. There is no sign of the glassy welded tuffs that are common in both the hanging- and foot walls of the la India structure farther N.





LEFT. LIDC 182 @ 168 m Volcanic sandstones, conglomerate and tuffaceous mudstone.



RIGHT. LIDC 182 @ 177 m Accretionary lapilli in fine grained tuff.

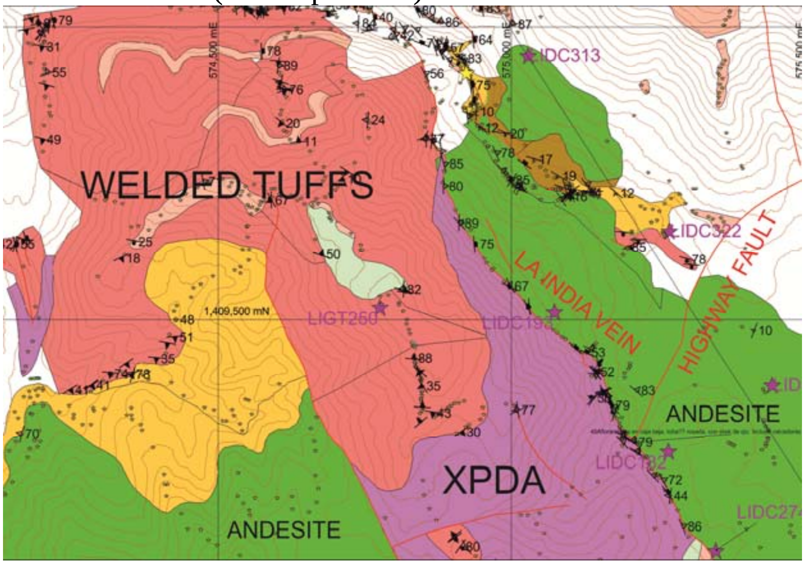
LEFT. WP 290. Coarse tuffaceous sandstones and fine conglomerates, moderately well sorted and graded. Underlies the porphyritic andesite sequence.

BELOW. WP 292. Sandstone package overlies volcanic breccias and is overlain by porphyritic andesite (not visible).

Specialized Geological Mapping

Figure 5 Examples of other tuffs and resedimented volcanic rocks.

The West side of the Highway Fault needs more work. There are some significant questions that need to be resolved by more mapping and by clarifying some of the Condor Gold logging. Firstly, what is the relationship between the stratigraphy on the SE side of the fault and the major sequence of glassy welded tuff, with a few thin units of felsic lava (FELS & XPDA), in the footwall of the la India Fault (see map below)?



There is a single drill hole (LIDC 182) in the footwall of the La India structure, logged during this visit, that cuts the tuff with accretionary lapilli; this may become vital in the future for resolving the stratigraphy. Likewise, hole LIDC 322, also logged, shows a major unit of XPDA overlain by welded tuffs. This XPDA seems to correlate with the upper XPDA unit shown on the screenshot above. LIDC 313 (see below, location shown on map above) seems to show a thick welded tuff sequence overlain by another XPDA unit. Both these holes imply that the bulk of the welded tuffs in the La India footwall are younger than the entire sequence E of the Highway Fault. But more work is required to confirm this.

4 IGNEOUS INTRUSIONS

Most epithermal systems require a heat source to drive fluid circulation. This is generally a large igneous intrusion, sometimes mineralized (porphyry copper or gold). No undoubted cross cutting intrusions were seen, but it is possible that some of the felsic lavas are high level sills (cryptodomes). It would be interesting to check upper contacts of these units, to see if they are peperitic, which would imply they are intrusions rather than lava flows.

There is increased propylitic alteration in the deeper holes in the SE (e.g. LIDC 323), with considerable epidote + chlorite + sphene/leucoxene + possible albite (?). Epidote locally reaches >5%. It is difficult to see this alteration as some kind of halo to the La India Vein; it is too far removed from the vein and too pervasive. It may instead be a broad halo of alteration around a large porphyry, possibly mineralized.

5 STRUCTURE

Tony Starling has described much of the structure, in far more detail than I will here (Telluris, 2015). He also covers the district, whereas I will refer only to the mapped area (Figure 1). His conclusions, in particular the idea of a tilted block to the SE of La India (see below), will be tested when the 3D model and sections are prepared.

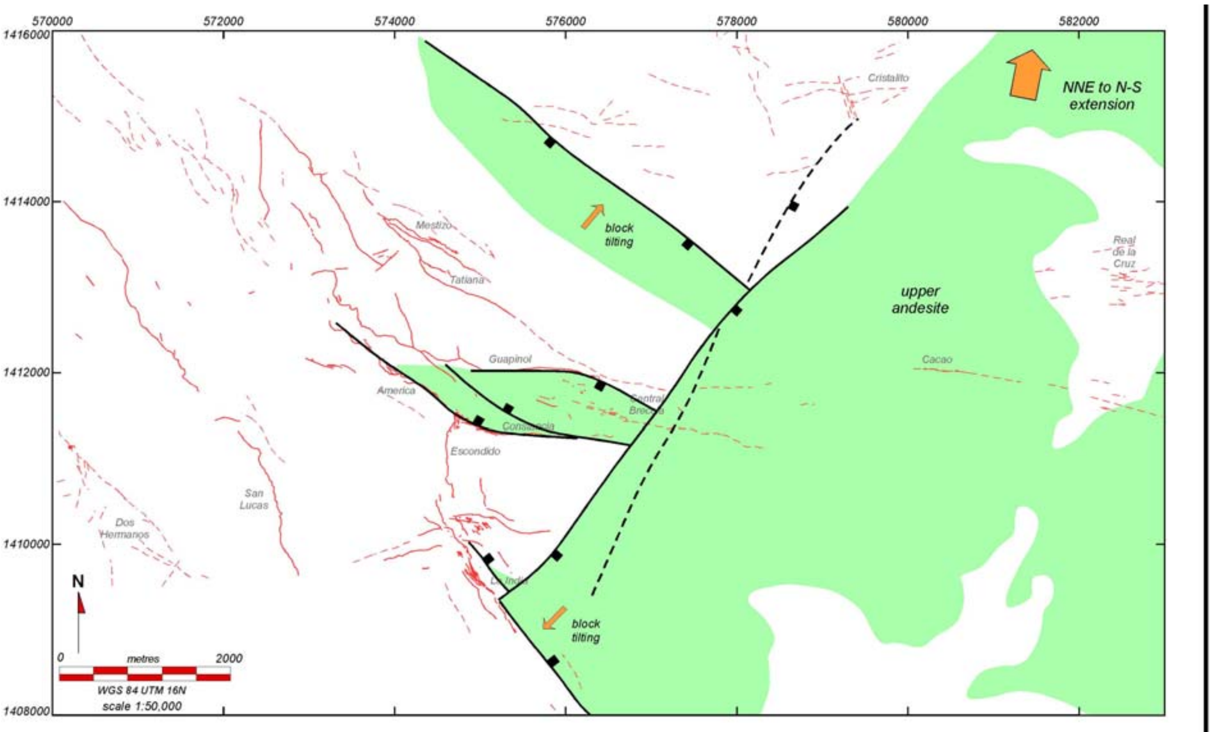


Figure 25 sketch plot for the La India district showing interpreted D_3 post-mineralisation reactivated structures

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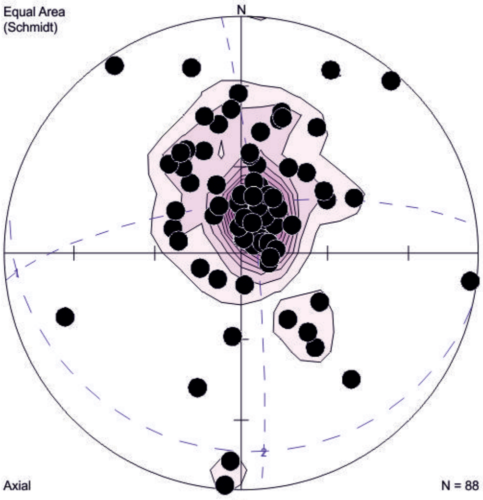
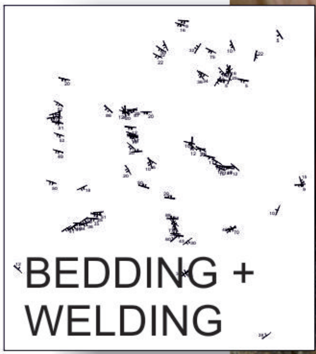
I refer to the ‘La India Structure’, rather than ‘La India Vein’. This is because there is clear evidence that the vein(s) follows a significant fault zone. This was probably present before, during, and certainly after, vein formation. In several places, the vein is absent, possibly cut out by post-mineral faulting. Cataclastite breccias, including vein fragments, are widespread (see Figure 6).

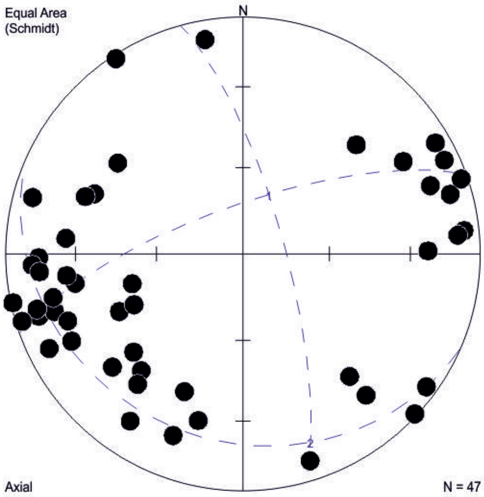
Initial 3D modelling (see videos in Appendix 6) suggests that in the central part of La India structure the veining is almost exclusively in the footwall of a major fault. The fault marks the contact between footwall felsic lavas and poorly mineralized andesite in the hanging wall (it has sparse veins). The fault is therefore through-going, the vein is not. This is probably true for many of the other veins in the district; many are associated with sub parallel faults.

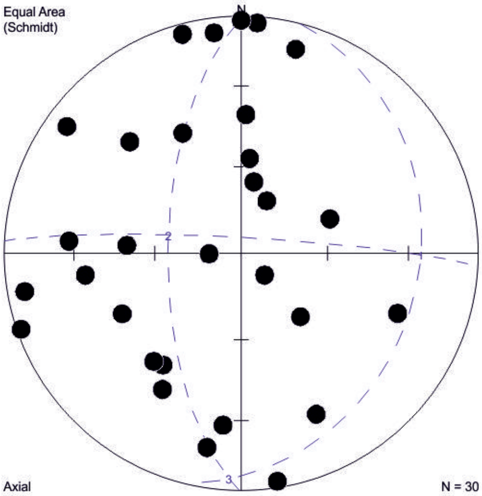
It makes sense to first map the La India fault, then secondly concentrate on veins and vein stockworks in the footwall (and, rarely, hanging wall). Post mineral faulting presents potential upside potential to the project: trying to find portions of the vein that have been cut out and moved elsewhere. The graphic below shows the geological history of an epithermal silver vein in Durango, Mexico; this vein was strongly cut up by post-mineral listric faulting. The tilting of the andesite at La India, as Tony Starling points out (Telluris, 2015), also implies a component of listric faulting.

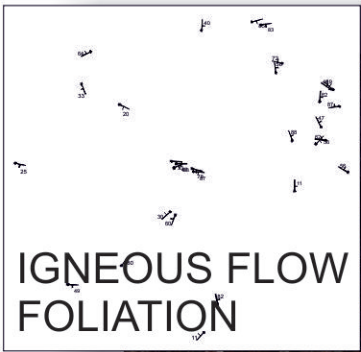




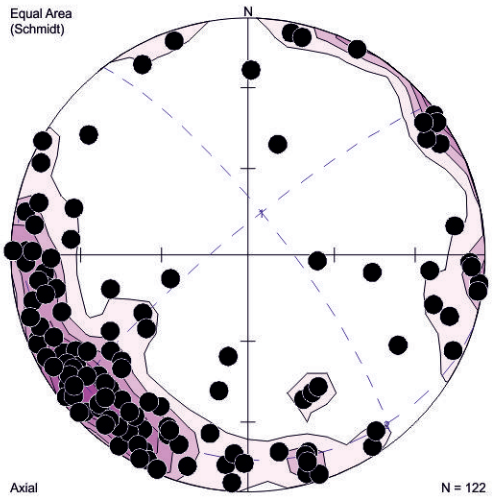
ABOVE. WP 46 Smooth fault with steeply pitching slickensides and quartz vein fragments.







ABOVE. WP 1356 Fault breccia with large crustiform vein fragments.



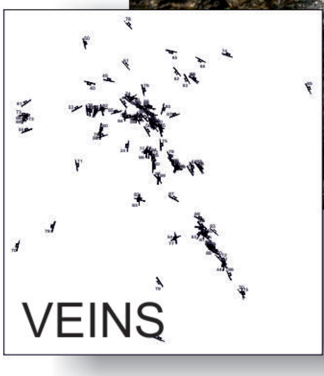


Figure 6 Structural data. Poles to planes, lower hemisphere, equal area projection.

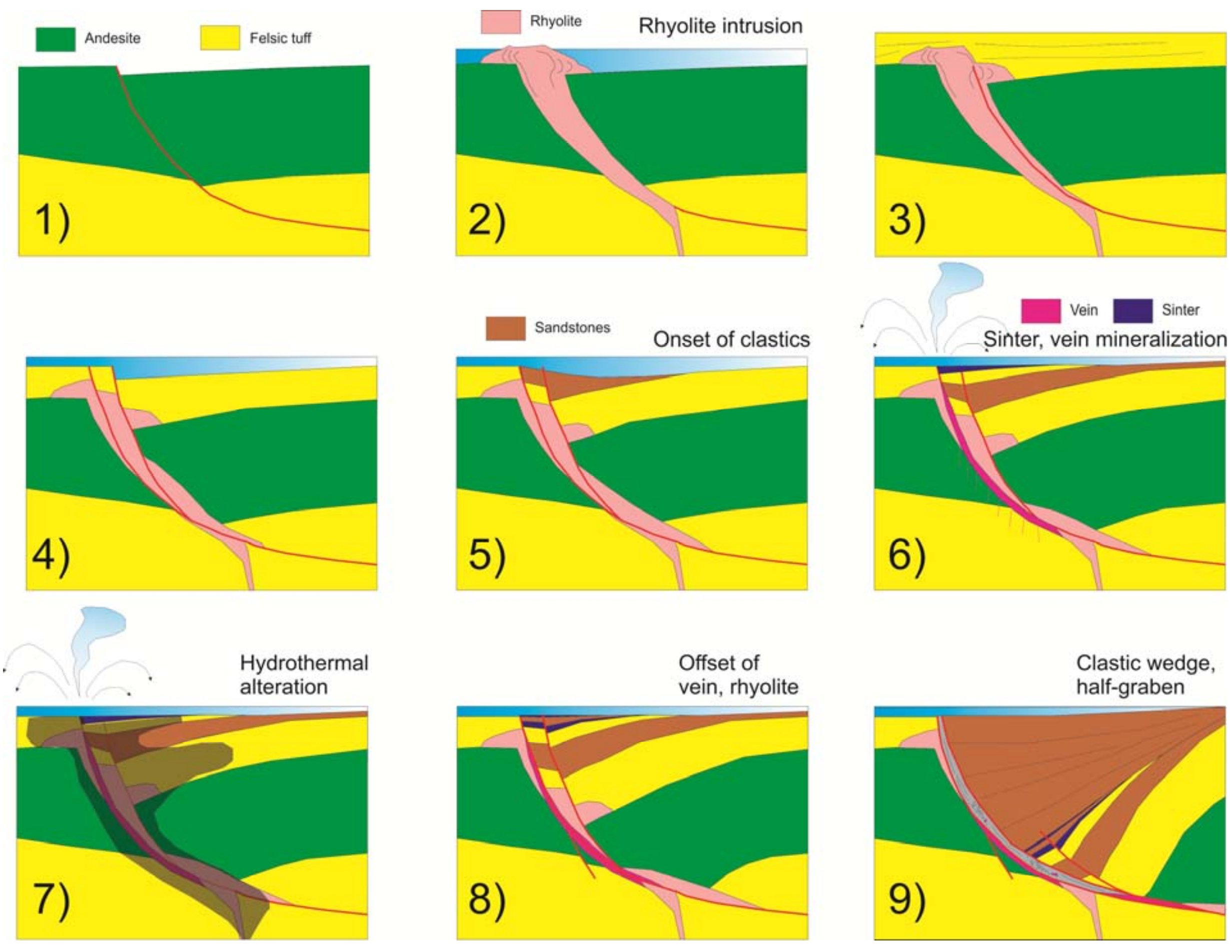
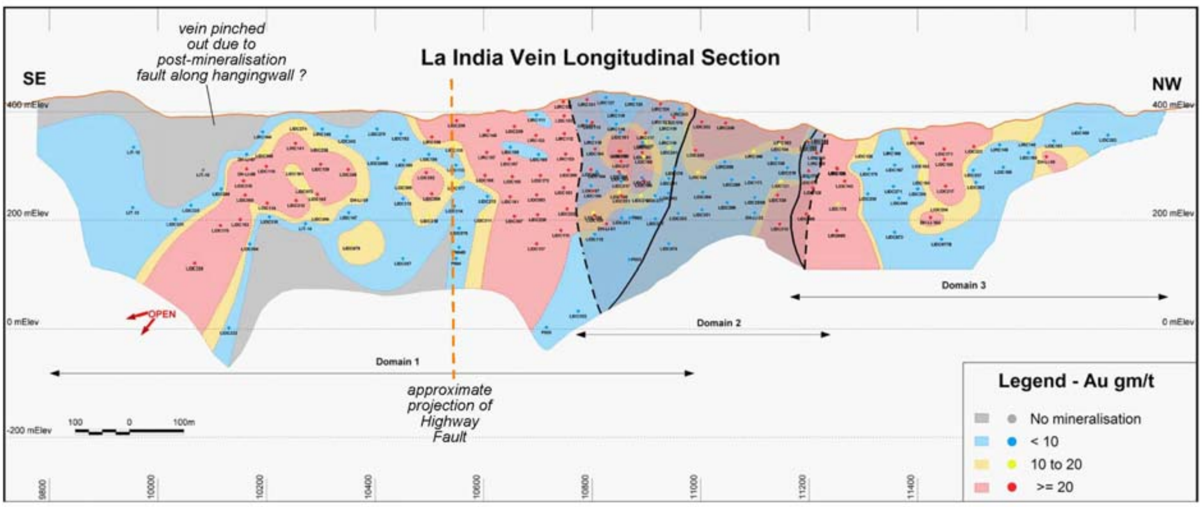
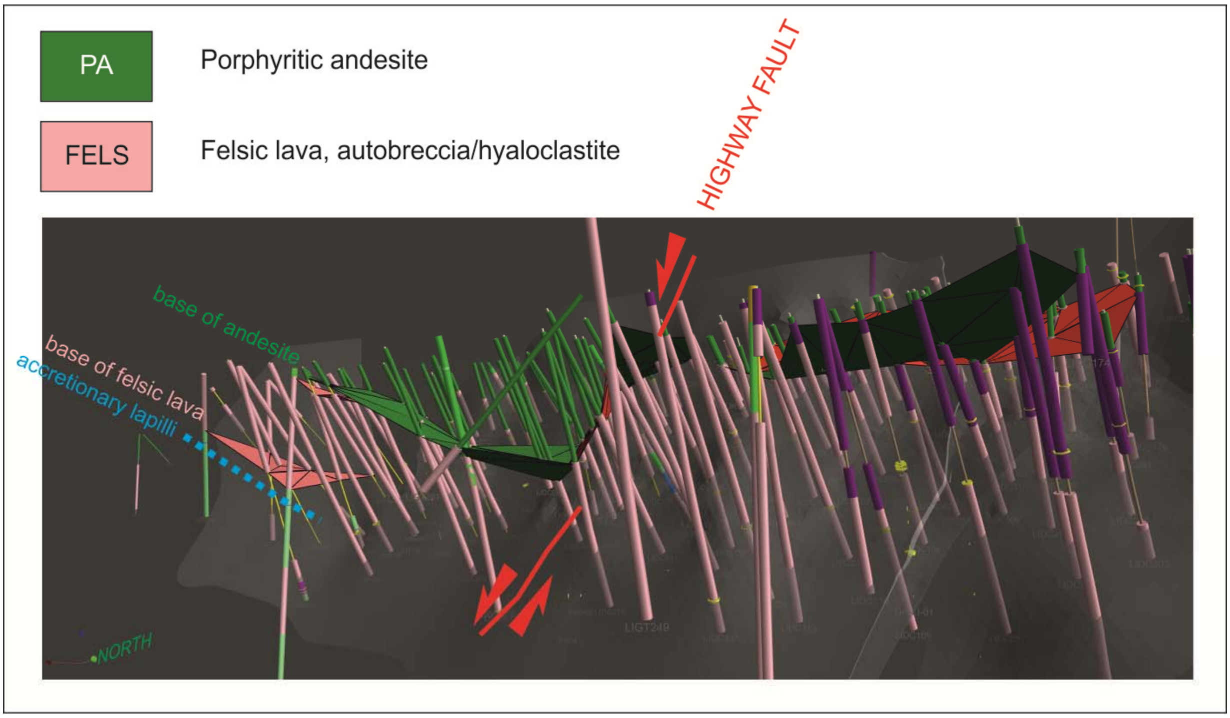


Figure 6 shows structural data as stereograms. There are no major surprises, but the welding fabrics in the tuffs provide a useful guide to regional dips; they tally well with bedding, implying that, with the exception of ultrawelded ignimbrites, which display rheomorphic folding, welding fabric can be considered as 'bedding'. This is vital for mapping and projecting stratigraphic contacts.

The 3D modelling shows the probable Highway Fault, more or less where predicted in the Telluris long section (see below).



The Discover 3D screenshot below, looking S, shows the Highway Fault, where it hits the La India structure. Faults are shown in red. The Highway Fault has a significant downthrow to the E. The tilting of the andesite is mirrored by the tilting of the underlying felsic lava (pink) and an excellent marker bed of tuff with accretionary lapilli (in blue).



6 HYDROTHERMAL ALTERATION

In the core we saw, the La India Vein displays very little evidence of wall-rock alteration. The normal illite/smectite + pyrite + leucoxene/sphene halos are missing or very weakly developed. More typical seems to be a weak chlorite + calcite + leucoxene/sphene + illite (?) alteration. Magnetite, one of the first minerals to be destroyed in typical haloes, remains intact in many intersections, right up to the vein contact; it is even present within some clasts within veins. Primary rock colours are preserved in the wall rocks, without the normal bleaching. The overall sulphide content (disseminated pyrite) in the wall rocks is exceptionally low (< 1%) when compared with other LS epithermal veins.

As at many other projects, the use of the term 'silicification' is a thorny issue at La India; the phrase is over-used. Silicified rocks in epithermal systems tend to be bleached white or grey; coloured minerals are removed. Iron from mafic minerals and magnetite/ilmenite goes into pyrite and leucoxene/sphene.

Many of the felsic lavas and welded tuffs at La India began life as glassy rocks rich in silica (rhyolite has > 69% SiO_2). Devitrification (spherulites etc) does little to reduce hardness. Most of the extremely tough rocks at La India are not silicified, or significantly hydrothermally altered. They are just glassy. However, in Section 3 I mentioned the tendency for the carapaces of the felsic lavas/domes to be silicified and bleached. This occurs well away from the vein conduits and I strongly suspect it is early diagenetic and not related to hydrothermal alteration.

There are some longer intersections of light green rock that display propylitic alteration (with epidote + chlorite + probable albite) (e.g. LIDC 323, in the SE). These are also extremely tough, difficult to scratch with the tungsten carbide stylus. I strongly suspect that this alteration is not related to the low sulfidation epithermal veins, but to a larger hydrothermal system or heat source, such as a porphyry system.

7 MINERALIZATION

The main thrust of our work was mapping the lithostratigraphy; we spent little time mapping the principal veins (La India, Arizona etc). Previous mapping seems perfectly reasonable quality. But the following comments are relevant to exploration.

The style of mineralization in the district is well-established. It is low sulfidation (LS) epithermal, characterised by discrete veins with crustiform textures, low overall sulphide content, hydrothermal alteration of wall rocks by near-neutral fluids, and sulphides with low sulphur content. Previous workers have established a paragenesis (history) of the vein (Galvan, 2012), though it seems over-simplistic and neglects some important phases (such as late calcite veins).

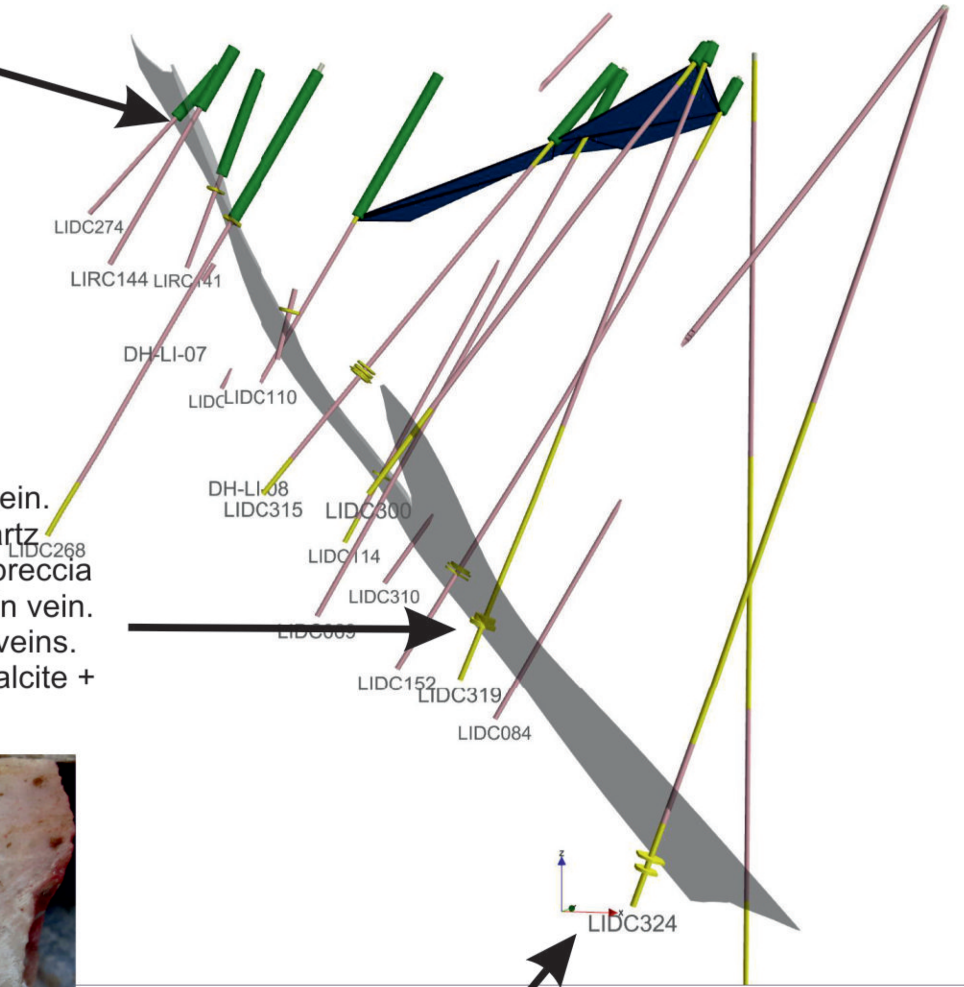
The main question to be answered at La India is 'what is the main control on gold grade?' Is it boiling level, competent host rocks or structural intersections?

We did not spend much time examining vein textures. Vein zones tend to be poorly preserved in the core boxes we saw, with poor recovery. Most core has been taken for assaying. This made it difficult to assess vertical changes in vein textures *versus* gold grade. We attempted this, on a single section line in the SE (Figure 7), but the results were, at best, inconclusive.

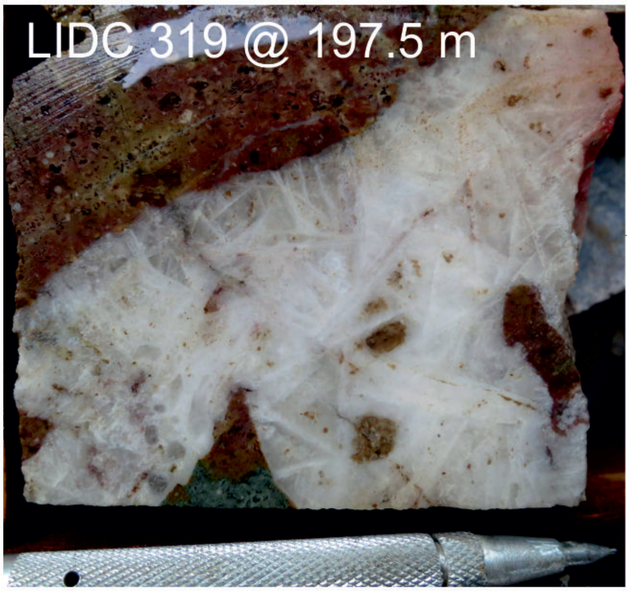
I noted in Section 5 the lack of hydrothermal alteration haloes. La India is therefore very unusual when compared with most other low sulfidation epithermal veins. The hydrothermal fluids, probably weakly alkaline, appear to have been confined to the conduits and had little interaction with the walls. This implies high levels, close to the original ground surface, and rapid cooling of fluids. There is widespread evidence of boiling, with the coarsest (up to 0.1 m long), and most widespread, bladed calcite, that I have ever seen in any epithermal district (see below; WP 1330). This calcite occurs across the entire district; in fact, we also saw it at Rio Luna.

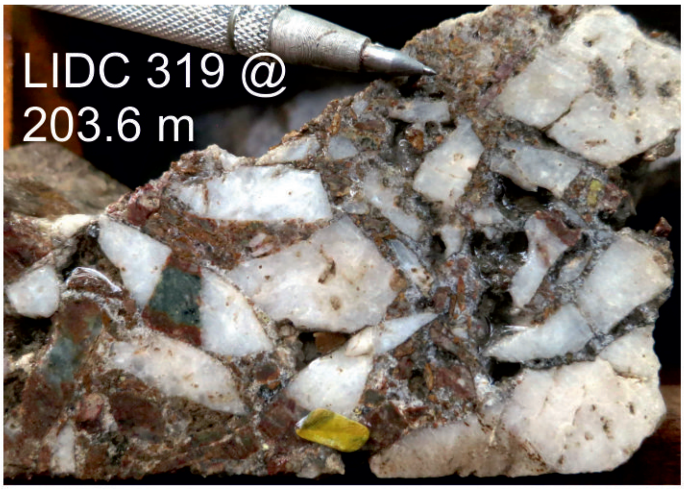
Briefly, bladed calcite grows in vigorously boiling fluid. As CO_2 is lost, calcite becomes insoluble and is deposited. It grows so quickly that it forms plates rather than the typical rhombohedral form (though there is plenty of this also at La India). These plates are frequently unstable in the fluids that follow and are replaced by quartz; at La India this replacement by

LIDC 274 Irregular veins of granular and zoned quartz. Simple textures.



LIDC 319 Crustiform quartz + calcite vein. Local Ag sulphides. Bladed calcite/quartz and probable pink adularia. Also vein breccia with calcite, local light green smectite in vein. Local chlorite + hematite selvages on veins. Wall rocks show chlorite + epidote + calcite + weak illite. Magnetite in wall rocks.





LIDC 324 @ 274 m Major crustiform calcite + quartz vein. Local massive clay (kaolinite?) in vein. Local light green chalcedony cut by late calcite veins. Local bladed calcite partly replaced by quartz. Minor Ag sulphides. Wall rocks comprise epidote + chlorite + trace pyrite (0.2%) and preserve magnetite. Propylitic alteration.

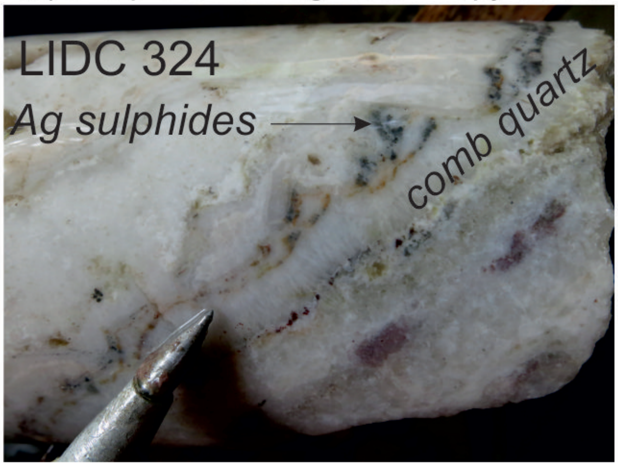


Figure 7 Example vein textures from a section across the La India vein.

quartz was commonly only partial, leaving a skeletal aspect on weathered surfaces.

Gold is commonly deposited during boiling. Adularia is another typical boiling texture and is widespread at La India (though less easy to identify without sodium cobaltinitrite staining) (Figure 8). In several holes we saw visible silver sulphides disseminated in adularia, probably with invisible gold.

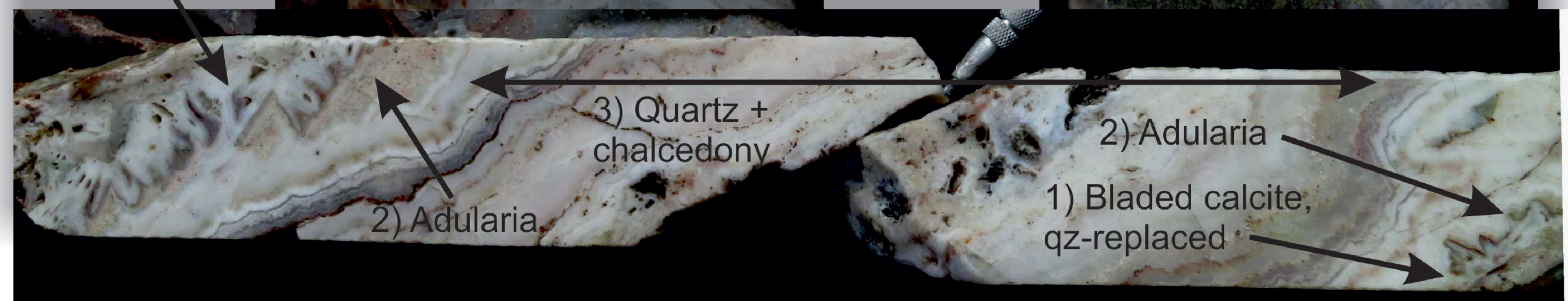
Bladed calcite and adularia were seen from the deepest holes to the highest surface elevations at La India (and in the district). This implies that boiling occurred over a wide vertical range. This is excellent news for exploration since boiling zones at many epithermals tend to be restricted (c. 100 m). It also implies that high grade oreshoots are probably not simply due to boiling level.

Some of the veins are perfectly symmetrical, with minerals growing from the walls in mirror image (Figure 8). Geopetal structures (fossil spirit levels) were seen in a few places, but are not common. They comprise patches of banded chalcedony, or sandy chalcedonic sediment, flushed into the conduit. Originally these bands were horizontally 'bedded'. They generally indicate proximity to the original ground surface. The best examples come from Central Breccia (Figure 8).

Other indicators of asymmetry in the vein conduit were seen. These include adularia that accumulated preferentially on ledges in the conduit; the ledges comprise an earlier phase of bladed calcite (see Figure 8). Adularia found it easier to nucleate on flat ledges and grow upwards.

Comments on vein textures in the field. Portions of the La India Vein were clearly strongly dilational; this was an open space into which minerals grew and developed crustiform textures, locally cauliflower-like, or with cockade quartz rimming 'floating' clasts. The processes were mostly passive and not explosive. There are relatively few explosive hydrothermal breccias within the vein. There is however, widespread syn-mineral stockworking and incipient brecciation of the footwall (see WP 1350 below). These breccias are mostly jigsaw-type and clasts can be reassembled. This again suggests a relatively passive process, not explosive activity. There are also late stage, syn mineral breccias cemented by coarse, simple calcite. An example is shown in Figure 7. This fits with the observation of very late, coarse simple calcite veins in many intersections.

Figure 8 RIGHT & BELOW Vein textures from LIDC 057 @ 225.2 m. FAR RIGHT. Geopetal structure (spirit level) from LIDC 297 @ 51 m.



There was widespread post-mineral brecciation (see Figure 6) related to fault reactivation.

3D modelling. This gives the best clue to controls on gold grade. The videos (Appendix 6) best explain the key features.

The La India veins are mostly confined to the footwall of a significant fault. This fault probably has significant post-mineral movement and, where it juxtaposes andesite and felsic lava, it is easily modelled. Tony Starling (Telluris, 2015) interprets the oreshoots as the intersections of new and reactivated structures. I suggest instead that they may be dilational jogs in an extensional fault system with a component of dextral strike slip. This is explained in the videos (Appendix 6) and in Figure 9.

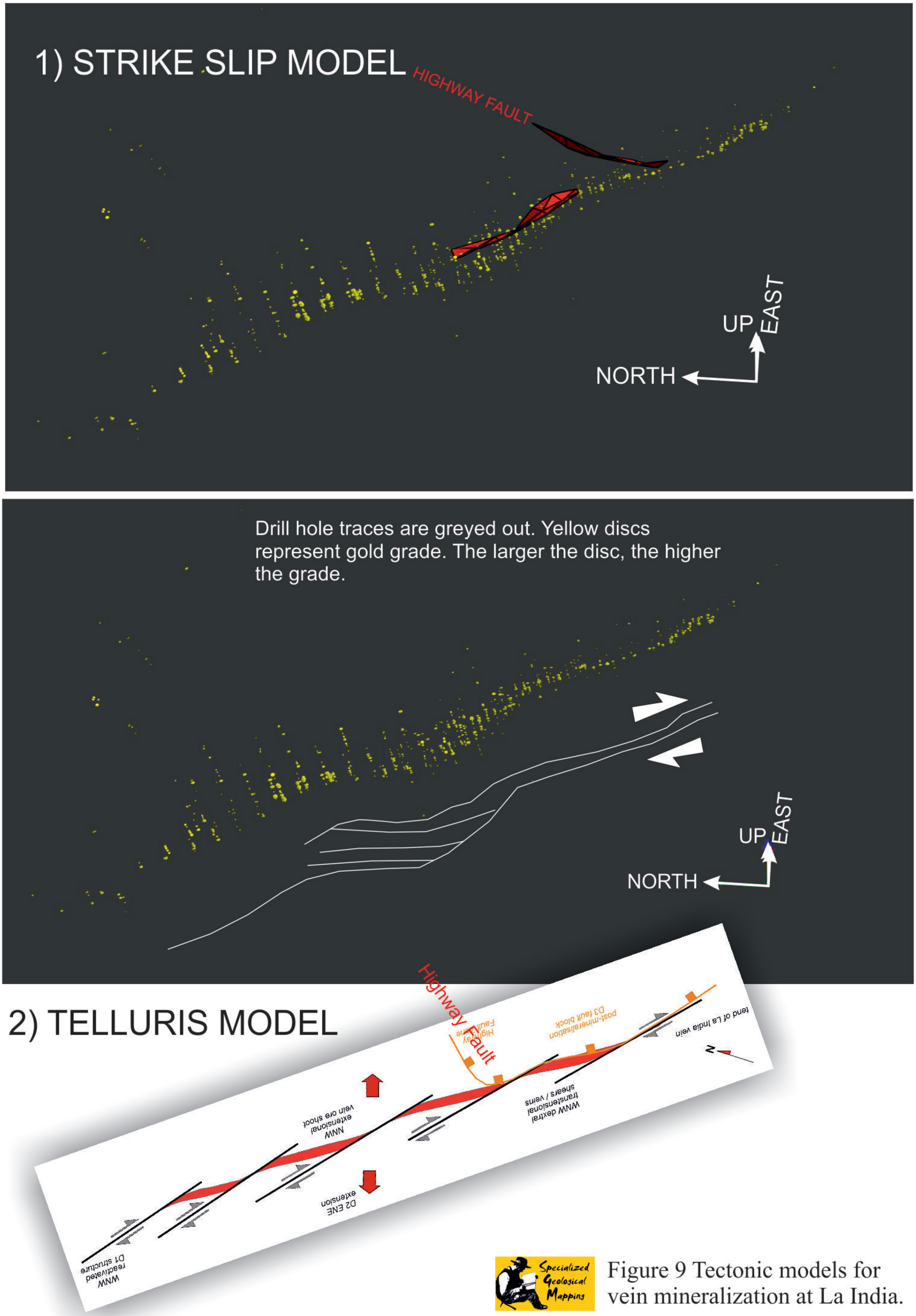


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Figure 9 Tectonic models for vein mineralization at La India.

8 CONCLUSIONS

The volcanic sequence is typical of a maar volcano and felsic dome district, with swamps and lakes. Many of the felsic flows may have been erupted into water, forming widespread hyaloclastite. Many low sulfidation epithermal deposits are associated with similar volcanic rocks e.g Kupol, Russia. We should expect to find diatremes; they may be very poorly exposed and poorly consolidated, easy to miss.

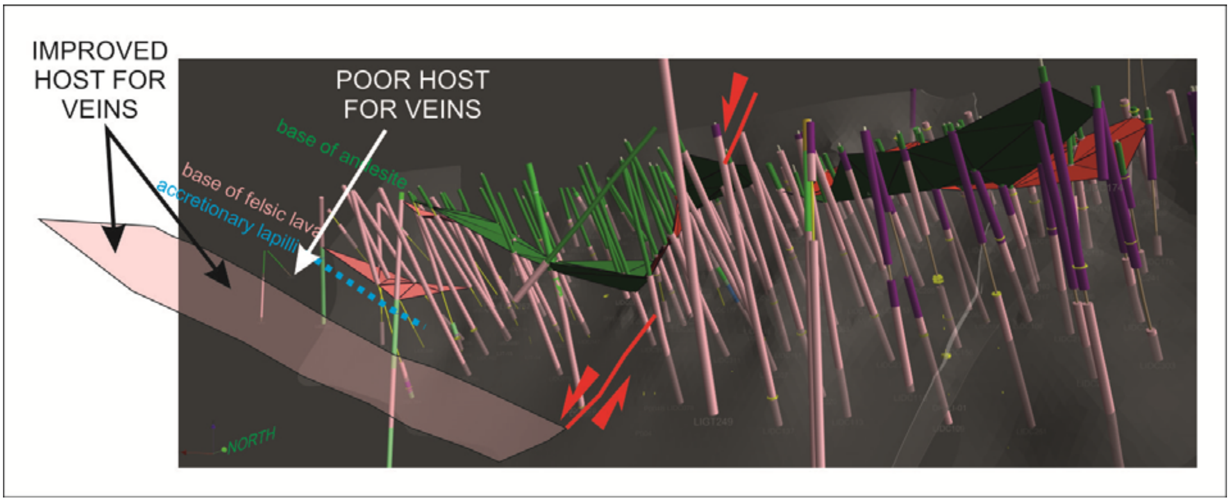
Some very siliceous felsic rocks, with common patches of quartz and chalcedony, occur a long way from the vein conduits. This silica is probably diagenetic; it is not a vector towards mineralization. This silicification masks the true geochemical composition of the lava, which resembles rhyolite, whereas the inner part of the flows is clearly dacite or dacitic andesite. There is evidence (cognate xenoliths) of magma mixing, with simultaneous eruption of two distinct chambers. I would expect these eruptions, and the voluminous welded tuffs (ignimbrites), were the product of caldera formation. The location of the source caldera is unclear. Many epithermal deposits show a relation to a caldera, commonly occurring on the border. There is an outside chance that the Highway Fault is part of the caldera margin (a trap door type caldera) and that the ultra-welded ignimbrites in its footwall represent the point of eruption, and collapse, of felsic domes.

There was a distinct lack of interaction between hydrothermal fluids and wall rocks; igneous magnetite is commonly retained. There is almost a complete lack of sulphides in wall rocks and the veins. This is good news for future acid mine drainage, but bad news for geophysical methods that rely on electrical properties. It also means that Terraspec (SWIR) analysis is not going to work well and may not be cost effective.

Every epithermal deposit has its strange character. At La India, this is the relative lack of wall rock alteration, despite glassy rocks, normally ideal for alteration. Good gold grades also occur over an unusually large vertical interval; strong bladed textures indicate boiling over this wide interval. I suggest that the boiling interval is great because wall rocks were 'tight' and impermeable. Fluids were thus confined to an open conduit, in contact with the surface and/or surface water (a lake?). Slight variations in the water table, or pressure/temperature conditions caused by choking (cementing by minerals) of the conduit close to surface, caused pronounced variation in the boiling elevation. This produced the great elevation variation.

Controls on gold grade are not entirely boiling related. Instead, structural intersections and jogs in fault systems (with dextral offset) are more likely critical (see videos in Appendix 6); they provided improved connectivity for fluid flow. I also suspect that certain rock types (e.g. felsic lavas) made excellent hosts for veining. More 3D modelling is required to establish, or discount, this.

I suggest that there will be an area of poorly developed veins and grades to the SE of La India; this will coincide with waterlain tuffs (in green below, including the accretionary lapilli tuff). These are probably not good hosts for veins. However, veins should improve farther SE as more competent felsic lavas again approach the surface (see conceptual sketch below). Mapping is required urgently in that direction, to establish the stratigraphy and dips. Step-out drilling may be disappointing, unless planned carefully.



A major fault, which we refer to as the Cascabel Fault, occurs SW of La India, on the flank of the major ridge. There are sniffs of vein mineralization along this structure and it has a very favourable orientation (parallel to La India). It has a major post-mineral displacement, bringing down a thick package of andesite on the W side. I would consider this to be an exploration target. Soil anomalies should be examined carefully.

9 RECOMMENDATIONS

Geophysics are not likely to produce good results because of the remarkable lack of disseminated sulphides and clays in the vein alteration halos. In particular, I do not believe that electrical methods will provide a 'magic bullet'. Ground magnetics may be the cheapest and most effective method and should certainly be considered before, and in preference to, any other method. Magnetite destruction is the simplest vector towards potential mineralization and veins, though there is precious little magnetite destruction at La India. Truth is, the best guide for finding new veins or oreshoots is walking the ground and rock sampling. This is best done by experienced geologists who can differentiate between volcanic and hydrothermal textures and understand the lithostratigraphy. This will pay more dividends than any 'remote sensing' technique.

Initially, I was keen on a Terraspec (SWIR) orientation study of La India drill core. However, having seen the lack of hydrothermal (clay) alteration in 3000 m of drill core, I am now much cooler on the idea. I do not think it will provide good value for money. Are the other targets, such as Andrea, different, or do they also display negligible alteration? There is no point carrying out Terraspec surveys on soil samples if this lack of hydrothermal alteration is typical of the district. Smectite (a distal alteration mineral in epithermal haloes, for example, famously, above Hishikari, Kyushu, Japan) is also an unfortunate product of tropical weathering of glass-rich rocks, abundant at La India. Terraspec will undoubtedly generate abundant smectite 'anomalies', but these will likely be false.

I deliberately did not delve too deeply into logging procedures at Condor Gold. Carlos Pullinger has done a good job, since continuous units jump out when carrying out 3D modelling (which is the acid test of any logging scheme). The felsic flows can go from coherent, to autobreccia, to hyaloclastite, to mildly transported. This can be confusing for geologists. But the key objective is to correctly identify the tops and bottoms of these units and model them in 3D.

A mapping program will be outlined in a separate document, but the emphasis will be on taking our mapping and filling in the gaps, answering questions, and extending the mapping outwards. I do not recommend leaping to an outlying area (the 'unknown') then working back to the 'known'.

10 MAPPING PROCEDURES

These have mostly been taught in the field. The emphasis was on recording data in a consistent and useable way. (Condor Gold geologists were already collecting data in a useful way and not much modification is required.) Also on mapping geological contacts and faults in the field, using topographic features ('feature-mapping').

Appendix 1 is a spreadsheet of field data from the visit. Carlos Pullinger and I have discussed, and agreed upon, a similar field data sheet for the future.

Appendix 1 is the foundation and kickstarter for future mapping by Condor Gold. Where possible, former mapping data will be integrated into this database. Armando Jr will be the data 'Czar' and ensure geologists provide him with up to date information. I strongly recommend that geologists enter their notes into the computer on the same day as mapping, even if this means leaving the field an hour earlier. It can be difficult to decipher even one's own field notes after a few days. I would like to be able to ask Armando Jr for the database (either Access or Excel) and get an up-to-date file, with yesterday's mapping results, the same day.

The spreadsheet must be as simple as possible. I don't want to get too involved with Condor Gold's other data systems (logging, soil sampling, rock sampling). But the traditional way is to have a single Access database with tables for rock sampling, collar, survey, field mapping data etc etc. That is Armandito's domain and I am not going to make any suggestions. I don't want to get sucked into that. I want to focus on the mapping and 3D modelling.

I recommend organizing field photos in folders by: geologist/date/waypoints. This is because the geologist will have to label all his field photos each night and he will be taking photos of his waypoints in the field (like I did, taking pictures of the GPS or my notebook to keep track). The 'field ID' number may not be assigned by Armando Jr for various days. Getting Armando Jr to relabel the field photos (with the final unique 'Field ID') is not recommended – it makes more work and may result in errors being introduced. So please follow the 'geologist/date/waypoints' folder system.

The lithology code column may remain blank if the geologist has doubt about what the rock is. Frequently I cannot identify a rock in the field with complete confidence and just describe its character (colour, hardness etc etc) then put a tentative ID at the end, with a question mark. Likewise, your geologist may take a structural measurement and no notes, which is fine.

You have your own logging lithology codes. I recommend you stick to those. My company has its own codes (which you will see on our drill logs – PA, PDA, FELS, XPDA etc etc), but we can figure out the equivalents down the line; that is my problem.

If I take two structural measurements at the same waypoint, I simply repeat the waypoint in the spreadsheet, but it will have a different, unique 'field ID' number. It is easier to get into the habit of making a new waypoint for every structural measurement. It doesn't matter if the coordinate is almost the same.

A GPS waypoint costs nothing. I take hundreds of waypoints in a day, almost without stopping walking, just saying 'porphyritic andesite', for example. These are then cut and pasted into the spreadsheet. This is a speedy alternative to 'green line' or outcrop mapping, as I showed the geologists in the field.

Simplicity is the key. There is a disease of trying to create spreadsheets and Access databases that cover all eventualities and have to be integrated. This depends on whether you are a ‘splitter’ or a ‘lumper’. I am a lumper because the big picture is often easier to see that way. I recommend that the final spreadsheet or Access table has the minimum number of columns.

Soil sampling. We discussed this at length in the field. I am strongly of the opinion that a geologist does not need to be present and record every detail of a soil sample. He should lay out the sample sites and provide some supervision to the soil sampling team. But also be free to explore local exposures and record geological observations. In most soil teams I have worked with there is always someone with secondary education (a foreman) who is capable of recording soil textures, colours and sketching profiles. Once the team has enough experience, he frees the geologist to do geological work.

(As an aside, I thought some of the soil B horizon material being targeted looked very dark and more like A horizon. Perhaps a check should be made that the right horizon is being targeted.)

11 REFERENCES

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12 DATA AND SIGNATURE PAGE

The main author, Warren T Pratt (PhD CGeol) is a Director of Specialised Geological Mapping Ltd, a consulting company based in the UK. He is a graduate of Hull University, UK (BSc Hons Geology, First Class, 1986) and the University College of Wales, Aberystwyth, UK (PhD Structural Geology, 1990). He has practiced his profession continuously for the last 25 years and is experienced in epithermal, porphyry Cu/Au, shear zone Au and VHMS deposits. Dr Pratt is a Competent Person as defined in Chapter 19 of the UKLA Sourcebook, Chartered Geologist (22 years), Fellow of the Geological Society, and Fellow of the Society of Economic Geologists. He won the President's Award of the Geological Society in 1994 for the preparation of detailed geological maps.

Dated in Urquhart, 28 June 2016

signed

Warren Pratt, PhD, CGeol

Appendix 1 Structural data spreadsheet

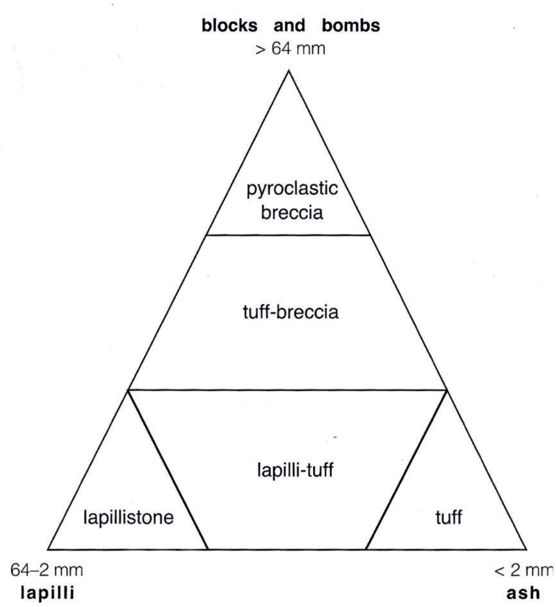
Appendix 2 Volume of A3 drill logs

Appendices 3-5 Volcanic classifications (from McPhie et al, 1993)

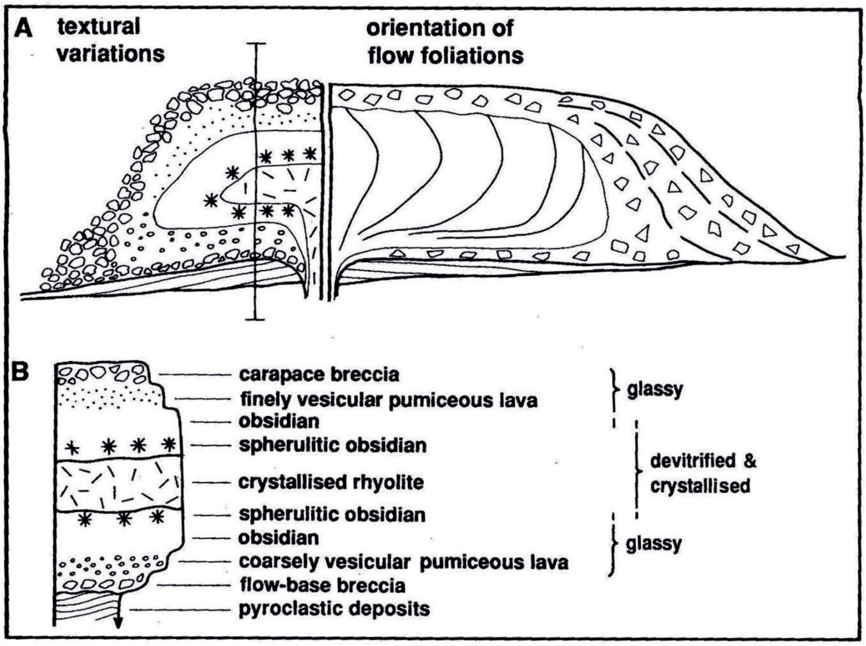
GRAIN SIZE	VOLCANICLASTIC DEPOSITS IN GENERAL and VOLCANOGENIC SEDIMENTARY DEPOSITS	AUTOCLASTIC DEPOSITS			RESEDIMENTED AUTOCLASTIC DEPOSITS
		Hyaloclastite	Autobreccia	Mixture or uncertain origin	
< 1/16 mm	volcanic mudstone	fine hyaloclastite	?	autoclastic mudstone	resedimented fine hyaloclastite , resedimented autoclastic mudstone
1/16–2 mm	volcanic sandstone	hyaloclastite sandstone		autoclastic sandstone	resedimented hyaloclastite sandstone, resedimented autoclastic sandstone
2–4 mm	volcanic conglomerate, volcanic breccia	granular hyaloclastite	granular autobreccia	granular autoclastic breccia	resedimented granular hyaloclastite, resedimented granular autobreccia, resedimented granular autoclastic breccia
4–64 mm		hyaloclastite breccia	autobreccia	autoclastic breccia	resedimented hyaloclastite breccia, resedimented autobreccia, resedimented autoclastic breccia
> 64 mm		coarse hyaloclastite breccia	coarse autobreccia	coarse autoclastic breccia	resedimented coarse hyaloclastite breccia, resedimented coarse autobreccia, resedimented coarse autoclastic breccia

GRAIN SIZE	PYROCLASTIC DEPOSITS		PYROCLAST-RICH DEPOSITS	
	Unconsolidated tephra	Consolidated pyroclastic rock	RESEDIMENTED SYN-ERUPTIVE	Post-eruptive resedimented or reworked, or uncertain origin
< 1/16 mm	fine ash	fine tuff	resedimented ash-rich mudstone	tuffaceous mudstone
1/16–2 mm	coarse ash	coarse tuff	resedimented ash-rich sandstone	tuffaceous sandstone
2–64 mm	lapilli tephra	lapillistone (or lapilli tuff or tuff-breccia)	resedimented pyroclast-rich lapillistone, resedimented pumice lapillistone, resedimented pumice and lithic lapillistone	tuffaceous conglomerate, tuffaceous breccia
> 64 mm	bomb (fluidal shape) tephra, block (angular) tephra	agglomerate (bombs present), pyroclastic breccia	resedimented pyroclast-rich breccia, resedimented pumice breccia, resedimented pumice and lithic breccia	

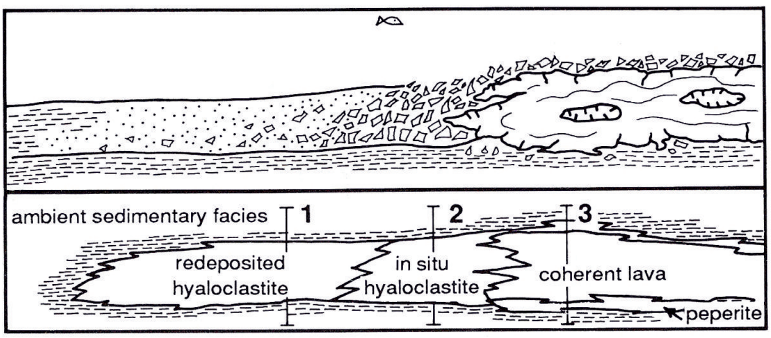
Table 3—Grain size-based genetic nomenclature for common types of volcaniclastic deposits. Modified from Fisher (1961) and Schmidt (1981).



Appendix 3. Recommended volcanic rock classification (from McPhie *et al.*, 1993 and references therein).



LAVA FLOW



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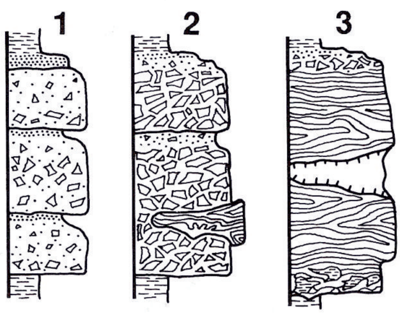
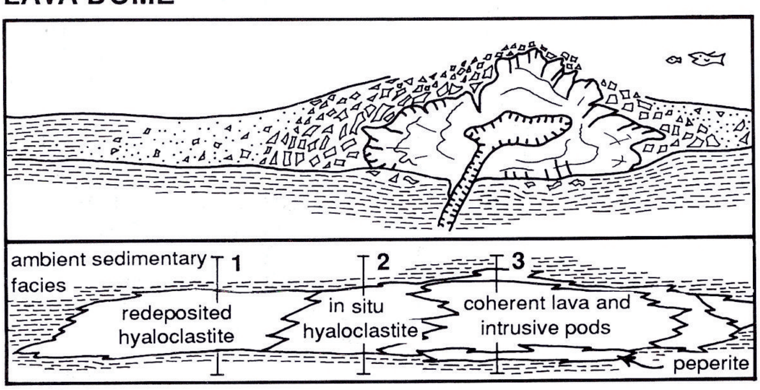
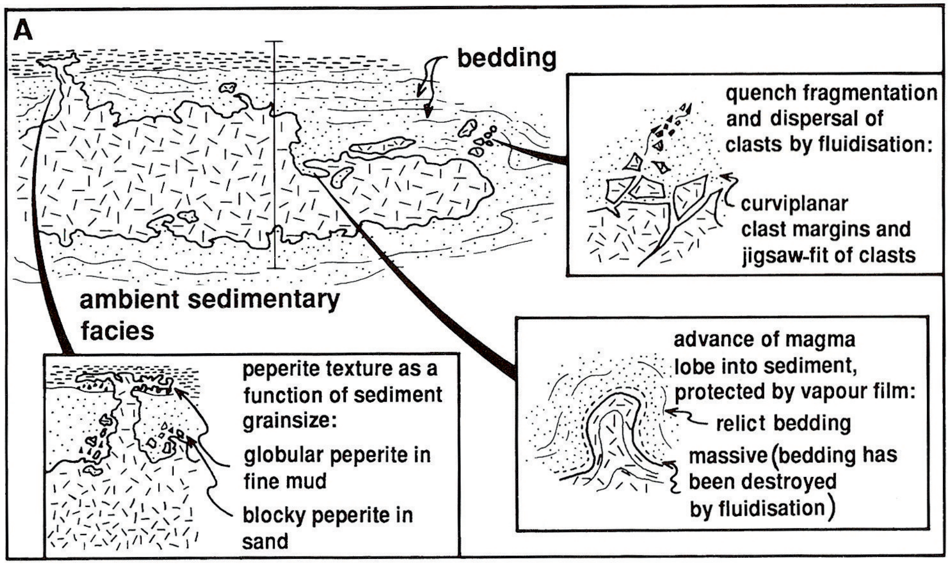


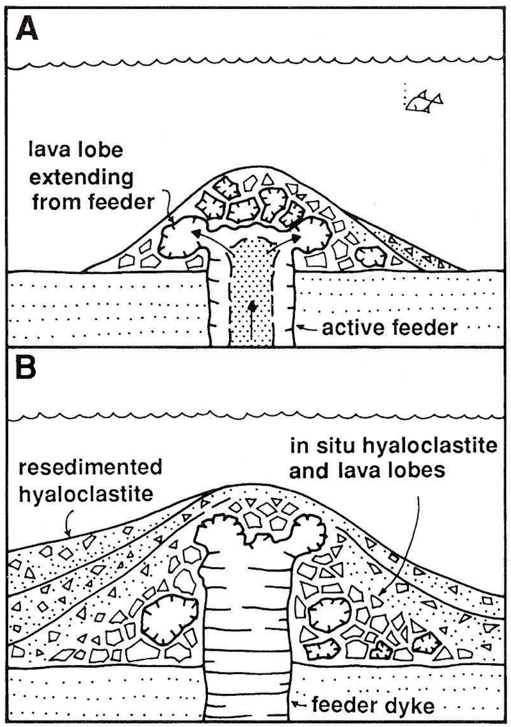
LAVA DOME

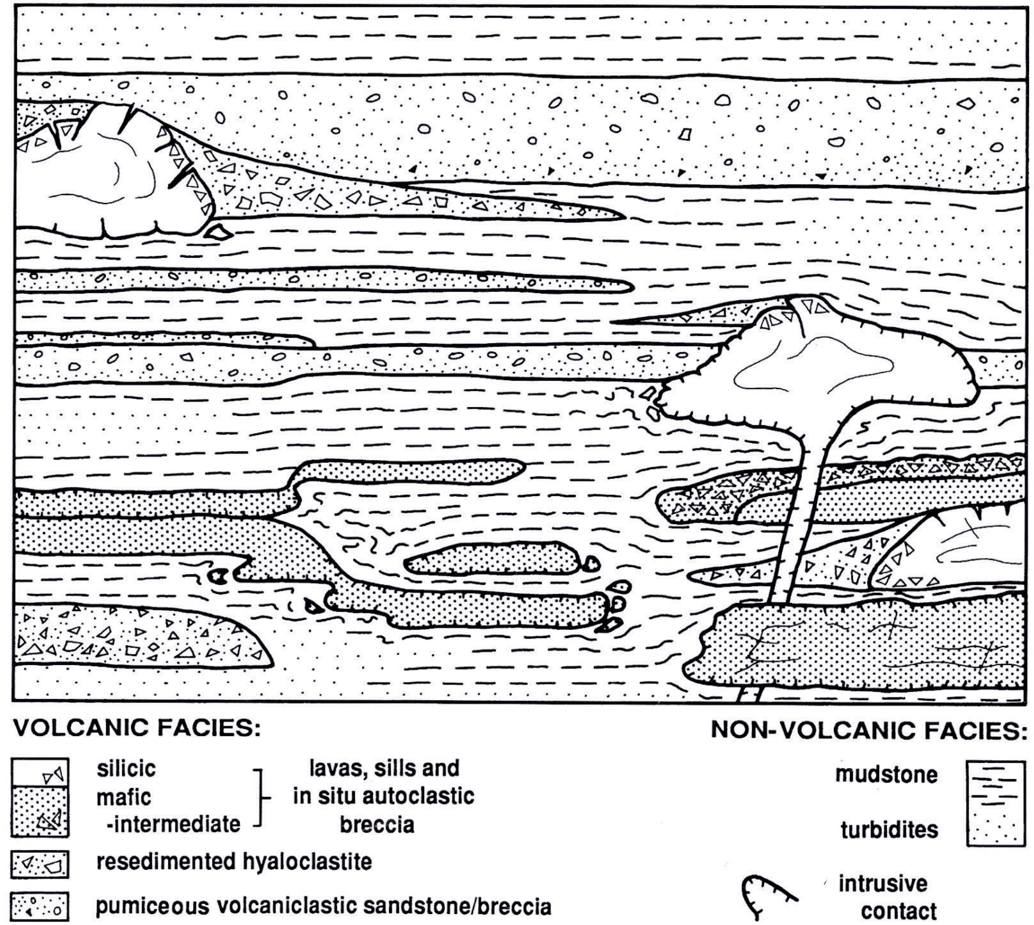


Appendix 4 Characteristics of dacite and andesite lava flows/domes (McPhie *et al*., 1993).

SILL







Appendix 5. Top right. Typical facies in a submarine volcanic sequence. Top left. Peperites. Bottom left. Hyaloclastite formation above a dyke. (McPhie *et al*., 1993).

Appendix 6 Video of Discover 3D workspace