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Memo

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Subject: Recommendation to add multi-element scans to exploration drill core geochemical analyses – DRAFT

1 Introduction

Drill core is essential for any mining exploration program and its characterization provides the information required to define a geological resource. Pending the type of characterization performed, drill core can also be used as part of environmental studies, including geochemical risk identification and management, even at the onset of resource delineation by the exploration geology team.

A common approach taken in the mining industry is to include multi-element analyses of drill core at the onset of an exploration program even before a resource has been identified. However, the current understanding is that Agnico Eagle primarily assays only for gold, with the occasional addition of silver and other metals such as copper. If the current approach was changed to include multi-element analyses, there are many opportunities that could ultimately help Agnico Eagle lower environmental risk at all stages of a mining project (i.e. exploration to post-closure), enhance geometallurgy programs, and possibly identify additional resource opportunities.

This memo provides justification for changing AEMs current geochemical practice for drill core to include multi-element analyses for all future AEM exploration programs. Justification provided herein is based on:

- Advantages for environmental assessment programs;
- Advantages for exploration geology and mineral processing;
- Opportunity costs at Agnico Eagle;
- Relatively low cost; and
- Industry best practice.

Each of the above justification topics, as well as general guidance on sampling frequency, are discussed in the following sections.

2 Environmental Assessment Programs

2.1 Program Objectives

Environmental assessment programs are focused on identifying impacts during and post operations of a mine site. Geochemical risks are likely one of the most significant concerns owing to the volume of material produced (i.e. 99.9% of rock processed is non-economic in even the best gold deposit) and the frequent long term nature of reactivity. For example, the Eagle/Telbel (i.e. Joutel) tailings facility produced neutral drainage for two decades but is now producing acid rock drainage (ARD).

2.2 Opportunities

Establishing geochemical reactivity (and also the geometallurgy) of an ore deposit is often based on hundreds of samples, not the 10,000s of samples that typically are used in defining the economic basis of an ore deposit. This results in significant uncertainty risk and waste rock management decisions either end up being overly conservative, too onerous for the site to manage during operations, or are missed completely. All of these scenarios potentially have impacts of several millions of dollars over the life of a mine.

The existing uncertainty is typically addressed by regulators and stakeholders through significant financial assurance (i.e. bonding requirements). The inclusion of multi-element data in drill core at the same frequency as gold assays offers an opportunity to dramatically reduce uncertainty risk (and therefore potential mitigation costs) as a result of the following:

- High resolution understanding of rock composition throughout the deposit – both in ore (for tailings), waste rock, pit walls, and borrow sources

- Potential to model non-economic rock (i.e. waste rock) reactivity for the entire deposit before it is mined – this is industry leading and far more efficient for planning waste handling as compared to waiting to analyse blast hole cuttings during operations and then deciding how to manage the rock

- Better confidence in mine planning, such as getting the most accurate understanding possible on how much material may need to be segregated or managed to mitigate long term closure liabilities. The current practice of designing rock and tailings storage facilities based on tens to maybe hundreds of samples is high risk

- Identification of non-reactive borrow materials within the waste rock zone around the ore deposit and elimination of the need to quarry for borrow material in some projects.

- Metal leaching assessment – the inclusion of multi-elements would allow for an immediate assessment of metal leaching risks. Even at the scoping level stage of project development, it could be assessed whether there is leaching risk of a given element that may require a water treatment plant to treat or require a change to the mine plan to mitigate the leaching process. Pending the type of element leaching risk, water treatment costs can easily approach $100M for CAPEX and $50M per year for OPEX.

There would still need to be detailed geochemical study on small subset of samples to properly correlate sulphide and carbonate reactivity to drill core geochemistry. However, once those correlations have been established, the combination with multi-element data throughout the deposit results in an industry leading approach to managing mine waste rock environmental risk. Two examples are provided in the next section.

2.3 Examples

2.3.1 Northern Ontario Open Pit Gold Mine

As part of project development studies for an open pit gold mine in northern Ontario, an ARD block model was developed for the deposit using multi-elements from exploration drill core. Detailed geochemical characterization testing prior to the block model established the following:

- ICP-MS sulphur analyses in exploration core were statistically correlated to sulphide sulphur (therefore ICP-MS sulphur was a suitable proxy for sulphide reactivity)
- ICP-MS calcium, magnesium, sodium, and potassium analyses in exploration core could be correlated to carbonate content (neutralization potential) using a regression equation. A regression was required to remove the contribution of the silicate associated calcium and magnesium from what was present in the carbonates.

Illustrations of the block model are provided in a three dimensional view (Figure 1) and cross-section through the pit (Figure 2). The high resolution understanding of waste rock ARD potential in terms of spatial and temporal locations (i.e. when it would be mined) in the pit provides a significant advantage to operations in terms of management timing, blending opportunities and facility design. The modeling also showed that previous testing had likely biased the amount of ARD proportion too high, resulting in higher than necessary closure cost estimates.

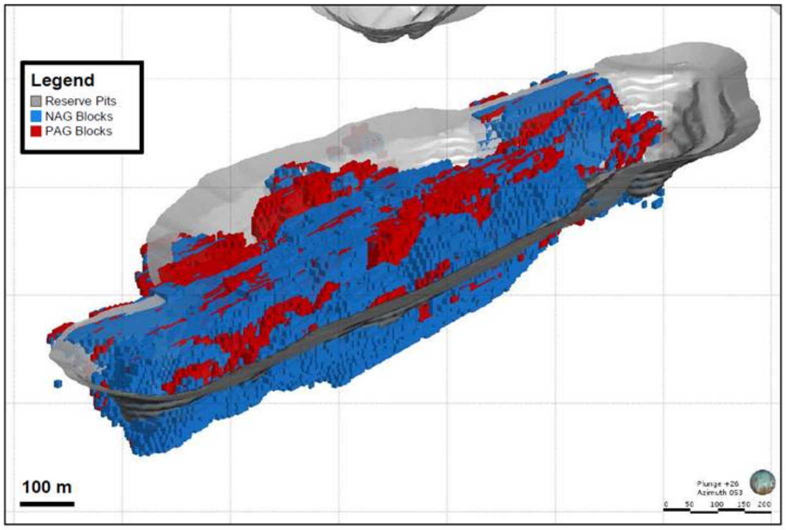

Figure 1: Three dimensional illustration of ARD PAG and NAG mine waste blocks.

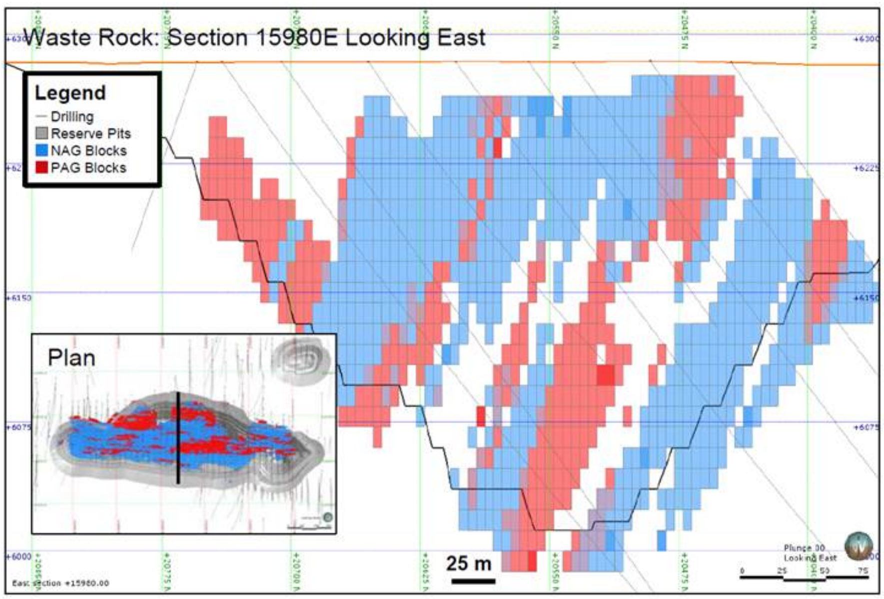

Figure 2: Cross section of potential pit showing ARD distribution.

Note: unshaded zones represent ore.

2.3.2 Akasaba West

The Akasaba West project is located in the Abitibi, approximately 23 km to the east of AEMs Goldex Mine. Currently the project is in permitting with a geochemical characterization program completed. The main finding of the program was that there will be upwards of 50% PAG rock, with the current plan to manage waste rock south of the ore body as PAG, and north of the ore body as non-PAG. The amount of PAG rock may be over-estimated in the south zone, or perhaps underestimated in the north zone, but the current database is not sufficient to better define the ARD management opportunity and risk for the project.

A multi-element database would likely be able to quickly (i.e. days) resolve the following:

- The estimated PAG proportions – this is important as it impacts closure costs and long term liabilities. For example, the current plan is to place a cover over the PAG rock to limit sulphide oxidation, but this is unproven on waste rock and the best approach is re-handling back into the pit and water submergence. Re-handling is high cost (the reason this method was not chosen), but with the potential to reduce PAG rock by upwards of 30%, the best environmental approach may become an economically favourable one.

- Confirm whether the north zone is truly all non-PAG. If PAG zones are placed in a pile they can develop as hot spots and will dominate the overall drainage of a pile. Having an ARD model for the waste would allow for an evaluation of this risk.

3 Exploration Geology and Mineral Processing

3.1 Program Objectives

Drill core is a necessity to define any mineral resource and the effort and cost is significant. It is logged by geologists to construct a geological model of mineral deposit, including identification of economic minerals (i.e. pyrite, chalcopyrite, native gold, etc), other features such as alteration, fractures, faults, etc, and it is also submitted for chemical analyses to delineate the economic boundaries of the deposit and ultimately the amount of mineral that can potentially be extracted. Typically a sub-set of drill core from the ore zone is submitted for metallurgical testing to establish and optimize mineral processing.

3.2 Opportunities

Three opportunities that could be realized by including multi-element analyses of drill core include:

- Pathfinding (both gold or other economically valuable deposits)

- Resolving uncertainty in drill core logging results

- Mineral processing or geometallurgy

Trace elements are a necessity for exploration geochemistry programs. The geochemical characteristics of rock near a potential resource often lead exploration teams to locate economic mineral deposits, which may not be readily identifiable through visual or other mapping programs. In addition, many mineral deposits being mined today were likely the target of a different commodity. For example, programs looking for gold have discovered copper or other base metal deposits. If drill core only includes an assay for gold the potential to discover other commodities is likely much lower. Of course mineral identification during logging may help provide clues to other economic deposits (e.g. the presence of chalcopyrite), but the extent and opportunity is likely lost if multi-elements are not included in the analysis.

Geological logging is a powerful tool that is relied upon to construct geological models of deposits and has been used to defend the exclusion of analysis for multi-element data in drill core scans. However, one of the biggest problems in generating realistic geological and alteration models is the lack of consistency in the logging data. Mine site drill hole data bases typically contain logging data collected over a period of many years. In most cases the logging will have been completed by tens of different geologists with varying amounts of competence and experience. Consistent logging requires a significant level of skill, but this task is generally assigned to the most junior geologists. As a result, there is a large degree of subjectivity in the recognition of basic rock types, and an even greater lack of consistency in correctly identifying alteration mineralogy, particularly when it involves logging RC chips (e.g. exploration programs in highly weathered environments like Mexico or South America).

Geometallurgy combines geology with extractive metallurgy to create a spatially or geologically based predictive model for mineral processing. As mineral recovery is dependent on the physical and chemical characteristics of the ore, only having a small sub-set of samples to develop the predictive model can result in economic risk in terms of poor recovery. Inclusion of multi-elements in drill core at the same frequency as gold assays has the ability to provide a much higher resolution of geometallurgy characteristics, and can also help identify the presence of deleterious or interfering elements to gold recovery processing. A summary of opportunity costs at Agnico Eagle are provided in Section 4.

3.3 Drill Core Logging Case Studies

Two case studies that illustrate the advantage of including multi-element data in drill core are extensively described in a paper by S. Halley Consulting geochemist at Mineral Mapping Pty Ltd. (summarized in Attachment A). The first example in his paper uses the Copler Gold deposit in Turkey to demonstrate how mutli-element data was able to quantity alteration that was not possible through geological logging. The second example in the paper was from the Haquira Porphyry-Cu deposit in Peru which employed partial digest ICP data to classify and model different types of Cu mineralogy.

4 Opportunity Costs at Agnico Eagle

There are a number of examples over the history of Agnico Eagle where having multi-element data could have resulted in significant (i.e. > $10M) cost savings for specific projects in terms of lost revenue. Some of these cost implications have been summarized by the geometallurgy group at Agnico Eagle and are provided in Figure 3.

Historically, there may have been some technological restrictions and prohibitive costs to including multi-element scans on drill core. However, at present day, the necessary analytical instruments are routine in commercial laboratories that Agnico Eagle uses for gold assay and the respective costs have decreased dramatically. Estimated analytical costs are provided in Section 5.

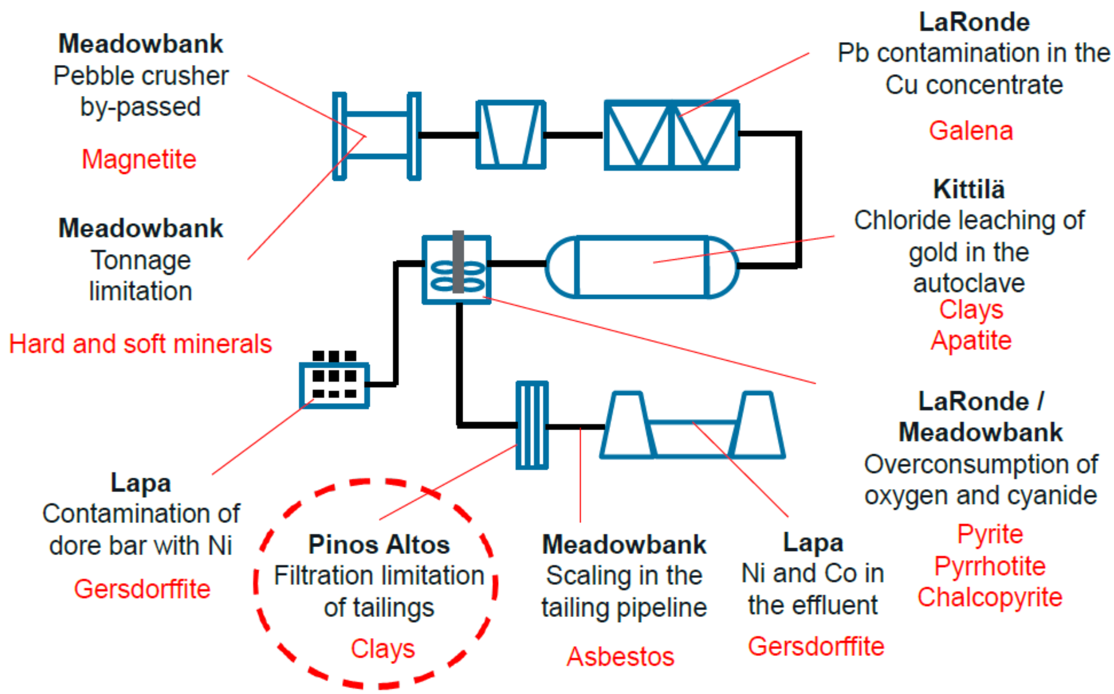

Figure 3: Process flow diagram with geochemical and mineralogical characteristics that led to revenue loss at Agnico Eagle operations.

5 Analytical Costs

The estimated cost to include multi-element scans on drill core samples already being submitted for gold assay is \$6.33 per sample. This is based on a discussion with ALS Minerals in Val d'Or and would include aqua regia digestion and analysis of 43 elements, including sulphur (ALS code ME-ICP-41). As a basis for comparison, the approximate cost for a gold assay is ~\$13/sample, which includes sample preparation from drill core. For instances where an element is being determined through ICP-MS (e.g. silver or copper), the data for all other multi-elements has actually already been collected by the analytical instrument and simply requires data interrogation by a software program to be reported. The cost was not provided in this case, but would likely be only on the order of a few additional dollars per sample given no additional analysis on the ICP-MS would be required.

When considering the cost for drilling, logging, and sample handling to acquire the gold assay, the additional cost is relatively minor compared to the costs of a drilling program. In 2018, Agnico Eagle's global exploration budget was estimated at \$100 M, with approximately 300,000 samples. At a cost of \$6.33/sample, this is only 1.9% of the budget (\$1.9M), which is less than a typical project contingency. More importantly, this cost should be considered an investment as ultimately it is expected to result in cost savings that are magnitudes greater than the investment.

6 Industry Best Practice

The majority of other mining companies, from juniors to senior producers, are including multi-element analyses of their drill core. This is based on experience of employees at Agnico Eagle that were previously consultants to other mining companies and our internal evaluations team.

Nearly every project database the evaluations team reviews (conservatively estimated to be greater than 90%) includes multi-element analyses on every drill hole. Many of the projects reviewed have block models developed for non-gold parameters such as copper, arsenic and sulphur. In instances where the models do not exist, the evaluations team will often generate block models for deleterious elements like arsenic, sulphur and selenium.

7 Sampling and Archiving Recommendations

Sampling frequency and archiving drill core for multi-element analyses should be based on the project stage:

- **Early exploration/pre-resource** – if multi-elements are not needed for prospecting, archive sample pulps used for gold assay for potential analysis of multi-elements at a later date. Ensure analytical laboratory is aware of potential long-term storage requirement so that pulp samples are not inadvertently disposed.

- **Resource definition activities**

    - Waste – if rock has the potential to be excavated (open pit or underground), it should be sampled and analysed. Typically a composite sample is taken every 1.5 to 3.0 metres, which would be sufficient, but will vary depending on the geological setting and understanding of the deposit. The sampling frequency should also be discussed with the resource geologist for the project to determine the sampling frequency needed to develop a block model.

    - Ore – all samples submitted for gold are to be submitted for multi-elements. Ore resource definition will benefit, as will geometallurgy and environment studies (e.g. ore characteristics leading to tailings reactivity assessment).

- **Feasibility studies/in-fill drilling**

    - Sampling and analysis should be the same as in resource definition activities described above for waste rock and ore.

8 Closing

Environmental and geological programs (i.e. exploration and geometallurgy) within Agnico Eagle would benefit significantly from the inclusion of multi-element scans. For a relatively small cost increase, additional gold or other commodity resources could be identified, mineral processing risks reduced (or optimized), and environmental risks and costs could likely be lowered in amounts far exceeding the additional costs.

Attachment A: Multi-Element Benefits to Resource Geology Case Studies

1.1 Quantitative Alteration Mapping at the Copler Epithermal Gold Deposit

The Çöpler Gold Mine is jointly owned by Alacer Gold (80%) and Lidya Mining (20%). It is located in Turkey, 120 km southwest of Erzincan and 550 km east of Ankara. It has Proven & Probable Reserves of 95.4Mt at 1.4g/t gold for 4.4 million ounces of contained gold, and Measured & Indicated Resources of 182.6Mt at 1.4g/t gold for 8.0 million ounces of contained gold (as at June 2012, 100% basis) Çöpler is an epithermal gold deposit (Yigit, 2006). It is centred on a nested group of dioritic stocks that have intruded into meta-siltstones and greywackes, and capped by a thick limestone unit. There are at least three centres of early, low grade, porphyry Cu-Au mineralization, with phyllic (sericite-pyrite) alteration haloes, predating the epithermal mineralization. Intense, low temperature, intermediate-argillic (illite, illite-smectite, smectite) alteration associated with the epithermal mineralization overprints the potassic and phyllic alteration in the porphyry system. All of the drill samples from Çöpler were assayed using a 4-acid digest and an ICP-AES method. This analytical technique achieves close to a complete digest, particularly for the silicate minerals. The elements assayed include gold, copper, a very broad suite of pathfinder elements, and all of the major elements other than silica. With a basic understanding of the alteration mineralogy, scatter plots of the major elements can be designed that will allow a classification of the alteration signatures for each assay interval. In mineral systems like Çöpler that involve feldspar-destructive alteration, the most useful plot is a molar ratio of K/Al versus Na/Al. Consider a rock that is totally sericitized. The mineralogy of the rock might be muscovite-quartz-carbonate-pyrite. All of the K and Al in that rock is contained within muscovite which has a composition of $KAl_3Si_3O_{10}(OH)_2$. Therefore the ratio of K:Al in the sericitized rock is 1:3. Similarly, a totally KSpar ($KAlSi_3O_8$) altered rock has a K:Al ratio of 1:1. In the same way, albitisation can also be tracked. Albite is $NaAlSi_3O_8$ with Na:Al =1:1. Figure 3 shows a K/Al versus Na/Al molar ratio plot constructed from 160,000 assay points from the Çöpler data base.

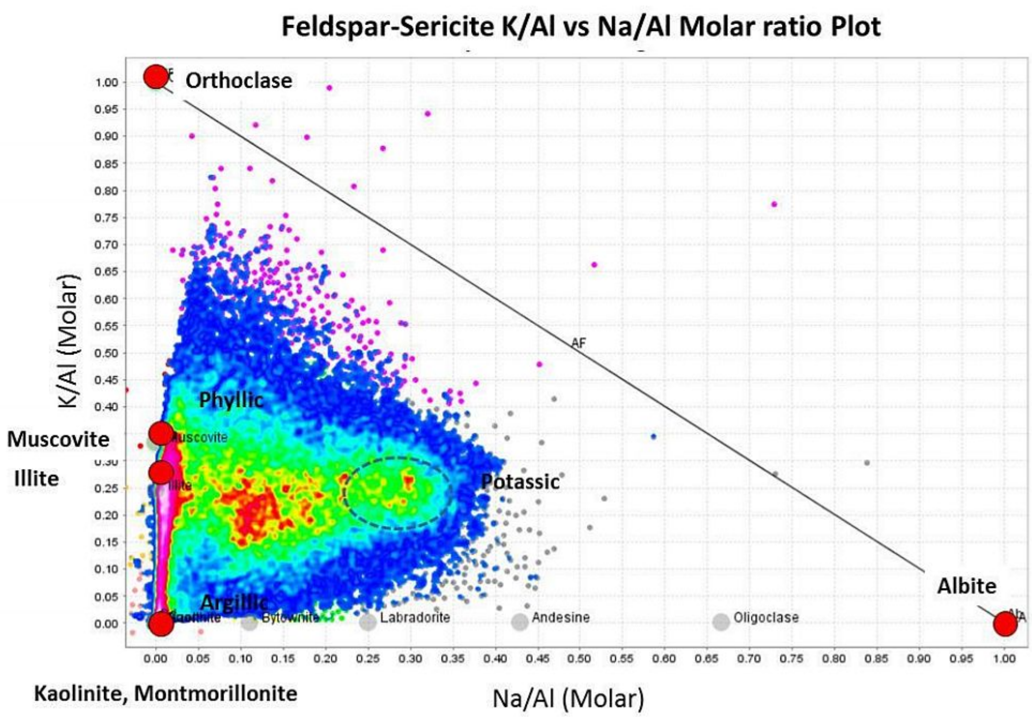

Figure 1: PER diagram of Feldspar breakdown

For clarity, a point density contour overlay has been applied. This figure shows an extraordinary extent of Na-depletion. The sodium-depleted rocks have complete spectrum of K/Al ratios from 0 to 0.33. This shows a continuum of alteration from intense phyllic alteration through to intense argillic alteration. The mineralogy ranges from muscovite to illite to interlayered illite-smectite to smectite and/or kaolinite. The clay mineralogy cannot be resolved from the assays. Infrared spectra were needed to determine the clay mineralogy. The hypogene clays are predominantly smectite, but feldspar-bearing rocks are weathered to kaolinite within the supergene zone. It is impossible for the geologists to visually distinguish intense illite from intense smectite alteration, or any gradation in between the two end-members, particularly when most of the drilling is RC. The down hole assay intervals were classified according to the mineralogy defined from the K/Al versus Na/Al molar ratio plot in Figure 3. From this plot, the intensely Na-depleted samples were classified as strong illite, illite-smectite, or smectite. Other points were classified as weakly or moderately sericitized depending on how far they had shifted from the projected position of least-altered diorites or sediments towards the projected composition of muscovite. Phengitic white mica may have K/Al ratios up to 0.45. Samples with a K/Al ratio of greater than 0.45 must contain another potassic mineral in addition to phengitic sericite. These points were classified as KSpar-bearing. The limestone and dolomite-bearing samples were classified from a Ca vs Mg plot. The mineralogy classifications are plotted on a long section through Çöpler in Figure 4.

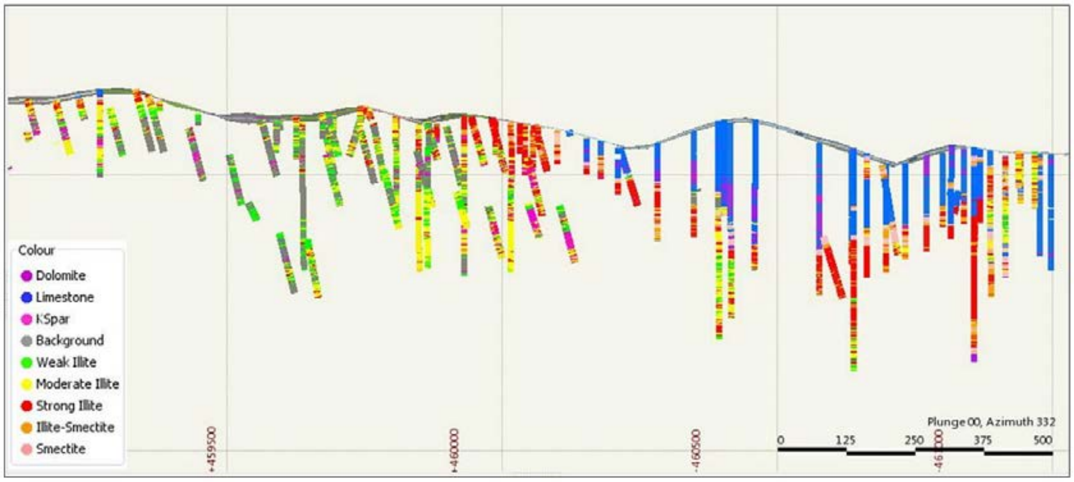

Figure 2: Mineral distribution derived from molar ratio plots on a long section of the Copler deposit

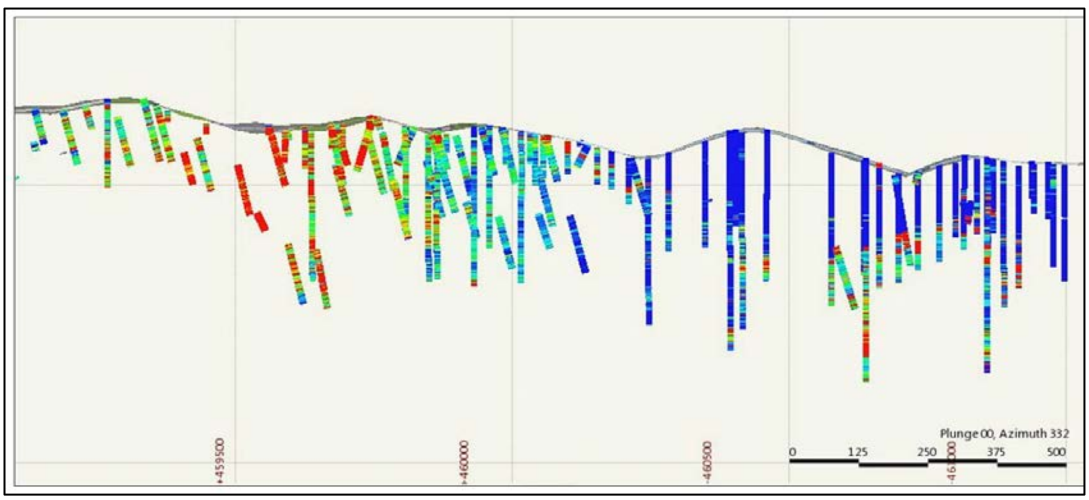

Figure 3: Copler long section with Cu>1500 ppm in red and Cu<100 ppm in blue

Figure 4 highlights the role of the limestone in acting as a cap on the hydrothermal system. A low grade porphyry copper centre is apparent from the copper assays in Figure 5 (left side of the diagram). There is also a narrow band of copper enrichment at the base of the limestone. The alkali element contents do not change significantly in the potassic alteration zone, because feldspars are stable here. There is a minor potassium addition where hornblende is replaced by biotite. Gold mineralization is primarily related to the intense illite alteration (Figure 6). A mineralogical model like this can serve a number of purposes in relation to the estimation of mineral resource and other applications. First, it provides some important clues in the resource modelling to help decision making about grade continuity and grade correlations from hole to hole. It is very useful from a geotechnical perspective, because rock hardness will be closely correlated with the bulk mineralogy of the rock. It provides the basis for recognizing potential problems with pit wall stability, because the distribution of clay-rich domains within planned pit walls is clearly highlighted. It is also very useful from a metallurgical perspective. Swelling clays may cause problems on the leach pads, or in mill circuits. Knowing the 3D distribution of the clays allows a targeted campaign of test work so that potential problems can be evaluated before they impact on the operation.

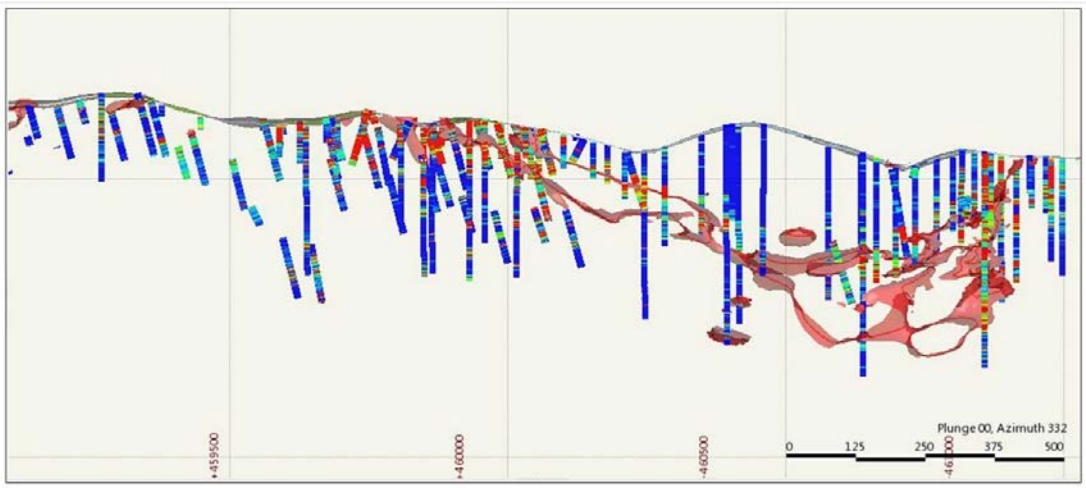

Figure 4: Copler long section with gold assays Au < 0.1 ppm in blue and Au > 1.5 ppm in red. The red shape is a volume of the strong illite alteration from Figure 4.

1.2 Haquira Porphyry Copper Deposit, Peru

The Haquira porphyry copper deposit is owned by First Quantum Mining Limited. It is located in the Andahuaylas – Yauri porphyry copper belt in Southern Peru. It is a copper-molybdenum porphyry with minor gold credits. Haquira currently has reported measured and indicated resources of 3.7 million tonnes of contained copper equivalent and inferred resources of 2.4 million tonnes of contained copper equivalent. All drill samples from Haquira were assayed with an aqua regia digest and an ICP-AES assay method. Aqua regia dissolves sulphides, carbonates, some secondary oxides, clay minerals and some chlorite, but it will not dissolve most of the silicate phases. Therefore, from an aqua regia digest, it is not possible to chemically classify rock types and alteration mineral assemblages as was done in the Çöpler case study. What can be done with this data is a classification of the sulphide mineralogy from Cu:Fe:S:Au:Ag ratios. Porphyry copper deposits are formed from very oxidized hydrothermal fluids. Initially, all of the sulphur that is exsolved from the underlying magma chambers is in the form of SO_2. As the fluid cools between 450°C and 350°C, SO_2 is converted to H_2S via a disproportionation reaction; $4SO_2 + 4H_2O = H_2S + 3H_2SO_4$. The ore fluid initially contains copper in excess of reduced sulphur, so bornite, with a high ratio of Cu to S is generally the first copper mineral precipitated in a porphyry deposit. As the supply of reduced sulphur increases, chalcopyrite is precipitated, and when there is an oversupply of reduced sulphur, pyrite is formed. Therefore a porphyry copper deposit generally shows a zonation from an inner bornite zone, to chalcopyrite, to an outer and higher pyrite-rich zone. Modelling the distribution of the sulphide minerals is important because the metallurgical characteristics of the ore will change significantly from zone to zone. This has traditionally been done from visual logging, with recognition and visual estimates of the proportions of bornite, chalcopyrite, pyrite etc. This requires a significant level of skill and experience on the part of the loggers, and a degree of subjectivity and inconsistency is unavoidable. Figure 7 shows a Cu:Fe:S ternary plot with the projected positions of bornite, chalcopyrite, pyrite, chalcocite and malachite.

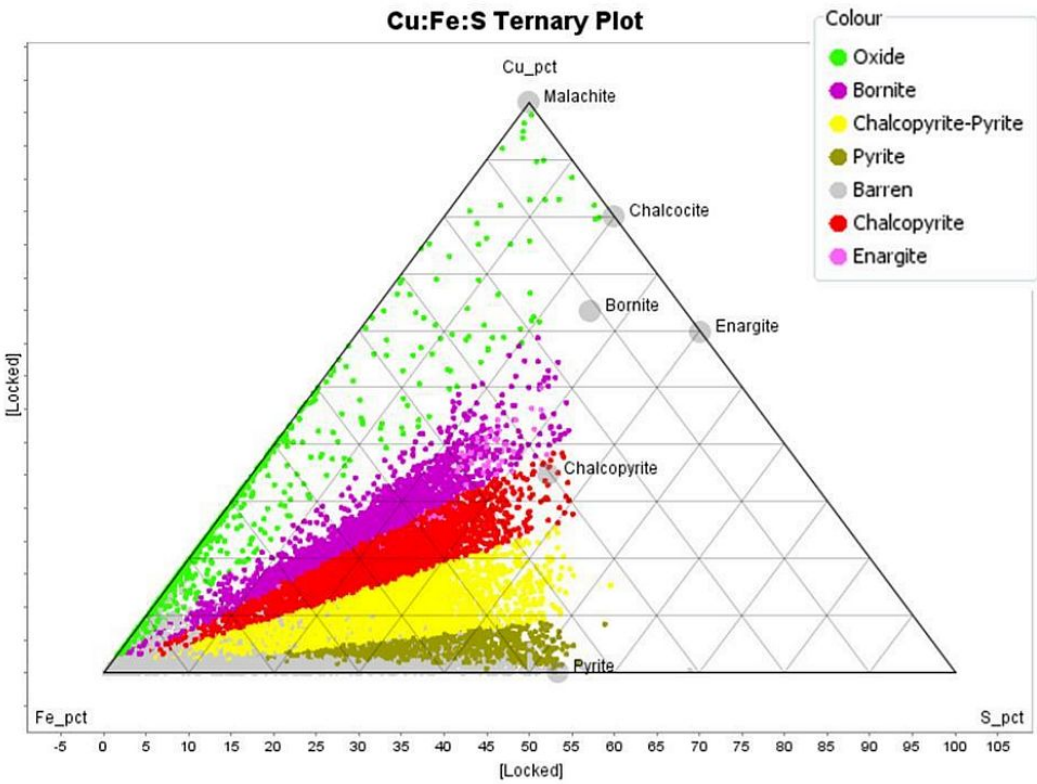

Figure 5: Ternary Plot from the Haquira Porphyry-Cu deposit. the Grey points are samples with Cu < 0.1%. The colour scheme shows the sulphide mineralogy predicted from this ternary plot.

From the ternary plot, samples with a Cu:S ratio greater than that of bornite (Cu_5FeS_4) were selected, coloured green, and labelled as oxide. Samples with a Cu:S ratio greater than that of chalcopyrite ($CuFeS_2$) and up to the ratio of bornite were selected, coloured purple, and labelled as bornite. Samples within this bornite group are likely to have a mixture of bornite and chalcopyrite. Similarly, three other groups were created for pyrite-dominant, mixed pyrite-chalcopyrite, and chalcopyrite-dominant samples. All samples with less than 0.1% Cu were assigned a grey colour and labelled as “barren”. A small group of enargite-bearing samples were identified from a plot of Cu versus As. The enargite bearing samples have a linear trend with a Cu:As ratio corresponding to the stoichiometry of enargite. Figure 8 shows scatterplots of Cu vs Au and Cu vs Ag for the two colour groups defined as “bornite” and “chalcopyrite”.

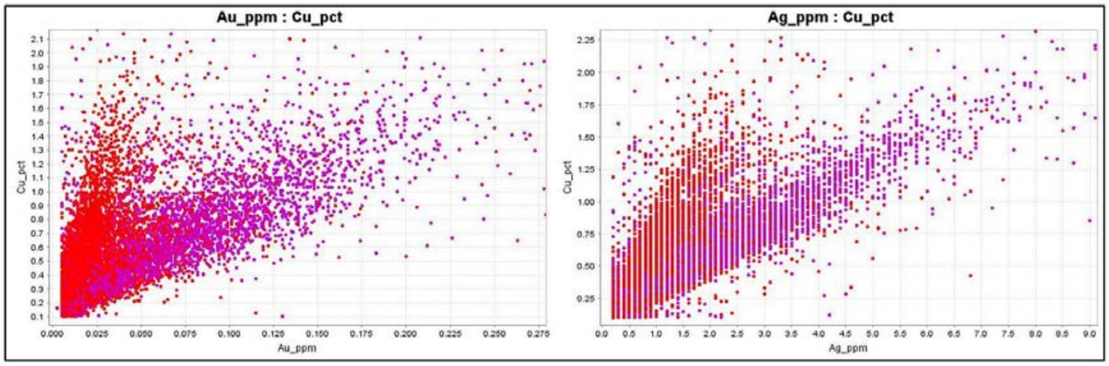

Figure 6: Cu vs. Au and Cu vs. Ag Scatterplots from Haquira East, showing red points (defined as the chalcopyrite group) and purple points (defined as the bornite group) from the ternary plot in Figure 7.

Note that both of these plots show bimodal populations. Virtually all of the points classified as bornite-bearing occur in the high-Au, high-Ag populations. The reason for this bimodal distribution is that bornite contains significantly higher levels of Au and Ag in solid solution than chalcopyrite. Ten percent of the points classified as "chalcopyrite" overlap with the bornite points on the Cu vs Au and Cu vs Ag plots. When the nature of the veining at Haquira is examined, the reason for this overlap becomes apparent. There is a later generation of quartz-molybdenite-pyrite veins that overprints earlier bornite and chalcopyrite veining. The points with high Au/Cu and Ag/Cu classified as "chalcopyrite" bearing, are actually samples with bornite veins, overprinted with quartz-molybdenite-pyrite, thus shifting them to lower copper:sulphur ratios. Thus, by considering the Cu:Fe:S:Au:Ag ratios within the assay samples, every assay interval can be classified in terms of the likely sulphide mineralogy within the samples. The metal values within each assay interval are a simply a reflection of the mineralogy of those samples. Recalculating the assays as weight percent of minerals rather than weight percent of elements provides the basis for making a quantitative mineralogical model. In the example illustrated here, this should greatly improve the reliability of metallurgical predictions for the ore body as a whole. Bornite-rich ore makes a higher grade concentrate than chalcopyrite-pyrite ore. quartz-molybdenite-pyrite, thus shifting them to lower copper:sulphur ratios.

Thus, by considering the Cu:Fe:S:Au:Ag ratios within the assay samples, every assay interval can be classified in terms of the likely sulphide mineralogy within the samples. The metal values within each assay interval are a simply a reflection of the mineralogy of those samples. Recalculating the assays as weight percent of minerals rather than weight percent of elements provides the basis for making a quantitative mineralogical model. In the example illustrated here, this should greatly improve the reliability of metallurgical predictions for the ore body as a whole. Bornite-rich ore makes a higher grade concentrate than chalcopyrite-pyrite ore. Figures 9 and 10 (below) illustrate how reliable and quantitative mineralogical domains can be created from the ICP-AES data.

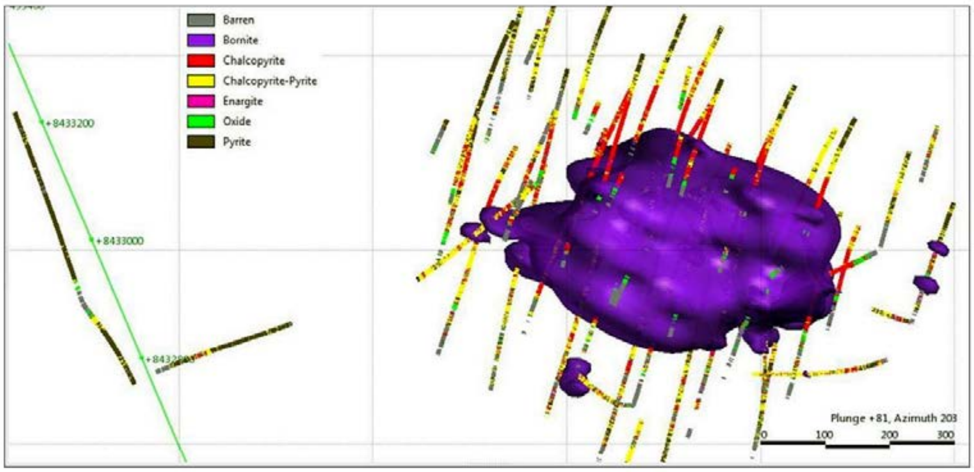

Figure 7: The Haquira East Bornite Domain predicted from the Ternary Plot of Figure 7 and the scatterplots in Figure 8.

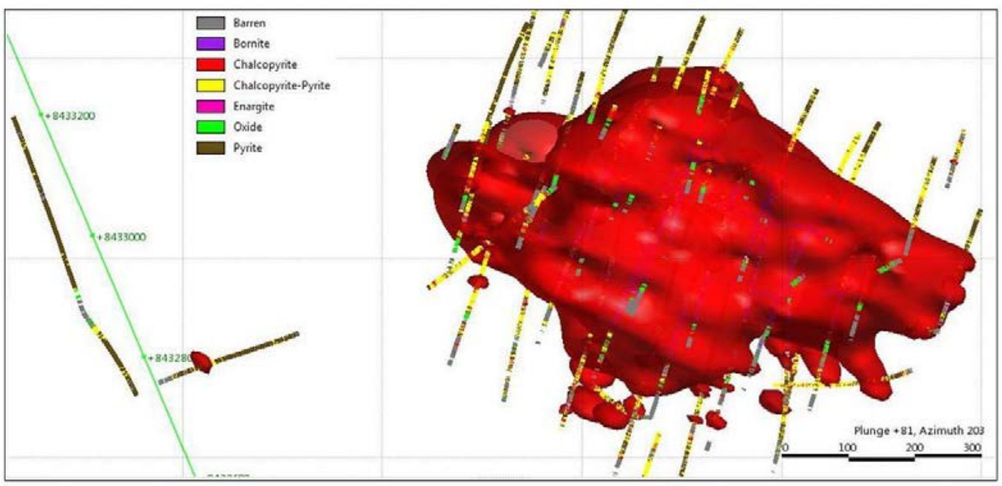

Figure 8: The Chalcopyrite domain from Haquira East. Assay intervals within this wireframe contain bornite (largely inside Cpy) or chalcopyrite, with only minor pyrite.