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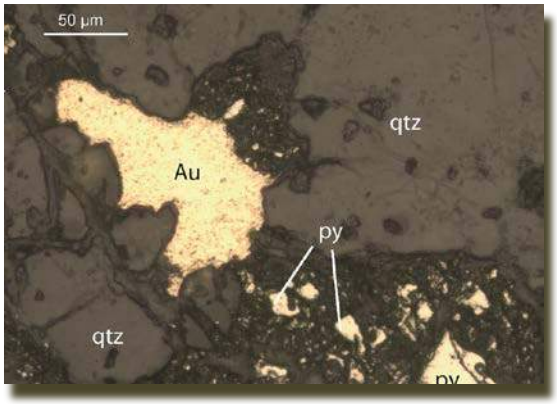
A Report on the Gold and other Metals in the Cao Ram Area, Đồi Bù District, Hòa Bình Region, Southwest of Hanoi, Vietnam

for:

Wishbone Gold Plc
Gibraltar



by

Michael D. Campbell, P.G., P.H.,
M. David Campbell, P.G.,
and
Jeffrey D. King, P.G.

I2M Associates, LLC
Houston, Texas and Seattle, Washington

May 23, 2014
Version 1.9

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Tran HuYen Diep …….. **Online:**

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Section 1.0 Executive Summary

A Report of Investigations has been prepared by I2M Associates (I2M) for Wishbone Gold Plc (WBG), Gibraltar, regarding the mining properties visited during January, 2014 located southwest of Hanoi, Vietnam in the Đồi Bù District, Hòa Bình Region. The key elements of I2M's assessment are:

- The area in and around the subject area has been explored for decades if not longer. The Chinese and then later the French conducted basic reconnaissance and produced the early maps of the area. The Russians explored the area in some detail via outcrop sampling programs and some drilling, but many sites within the area of interest remain poorly investigated and untested. The general area has received only superficial investigation to date on the obvious fracture zones and associated geological structures.

- Since the late 1990s, the Vietnamese Geological Survey and associated groups have undertaken the systematic assembly and cataloging of all available geological, geophysical, and mining information on the reported minerals present in Vietnam, almost all of which are in Vietnamese.

- Various Government groups are involved in all mineral exploration and mining programs in Vietnam for the purpose of supporting exploration and mining and for purposes of regulating the exploration and mining activities to ensure that the health and safety of the local inhabitants, livestock, and the local surface water and groundwater are protected for long-term use by the people of Vietnam.

- WBG management is considering a joint-venture with one or more Vietnamese mining companies to expand the current limited production of the producing mine at Hop Hoa and to re-develop mining operations at Vai Dao by conducting exploration to locate and to expand the current gold resource base at both sites.

- After reviewing the literature and selected translations of the reports relating to the areas of interest, combined with the information gained during our visit in January, 2014, and from the samples taken from outcrop that have been evaluated through petrographic analysis and tested at an international laboratory for their elemental constituents, we have concluded that the areas of interest have an unusually high potential for world-class ore bodies to be present at shallow depths, especially those containing gold and silver.

- Of the 31 samples obtained from outcrop in the Hop Hoa, Vai Dao, Lang Sen, and Lien Son areas, 42% of the total number of samples analyzed show gold values in excess of 1 gram per tonne (g/t), seven of which contain greater than 5 g/t with two higher than 25 g/t (i.e., 25.6 and 68.9 g/t). Although the high analyses may be the result of the "nugget"

effect, they suggest nothing about the available volume of mineralized rock surrounding the samples and their metal content until drilling is conducted to determine the horizontal and vertical extent of the zone and grade of associated gold, silver, and other metals contained therein.

- The type of mineralization present in the area of interest suggests that other metals (silver, zinc, etc.) of economic significance would likely occur with the gold making any mining and processing design a multi-metal venture.

- Based on the new Government initiatives to encourage overseas investment in Vietnam, especially from European, Middle Eastern, American and Canadian mining companies, regulations and mining laws are being enacted to assist in this transition to partnering with overseas companies.

- Should a joint-venture with a Vietnamese partner be consummated, the next step is to begin the exploration program for the purpose of proving at least 10,000 ounces of gold in place. This should be followed by a feasibility study to determine the economic and practical viability of mining, either by underground or open-pit methods, and of processing the ore with currently available technology.

- Based on sampling of the tailings at the Cam Vao Processing Plant near Cam Ram, the associated tailings pond, and the adjacent creek, all three areas contain elevated concentrations of arsenic, cadmium, mercury, and lead. In the event a joint-venture is formed with the company owning the Cam Vao Processing Plant, a full environmental assessment should be conducted in and around the existing plant and extending to and including the associated downgradient rice paddies.

- Either an affiliate of the United Nations, the World Bank, or other international agencies may have an interest in underwriting or encouraging funding of the environmental assessment we have recommended herein because elevated arsenic is a widespread problem in the water supply of northern Vietnam, especially in the Hanoi and surrounding areas.

Section 2.0 Scope of Work

Wishbone Gold Plc. (WGB) engaged I2M Associates, LLC (I2M) via agreement dated December 2, 2013 to provide an independent assessment and review of the nature and characteristics of the mineralization involving gold and other metals in the Cao Ram area (referred to as subject area) of the Đồi Bù District, Hòa Bình Region, southwest some 40 kms from Hanoi, Vietnam. The I2M assessment also involved an assessment of the merits of future expansion of current operations on mining properties located within the subject area, where merited (see Figure 1).

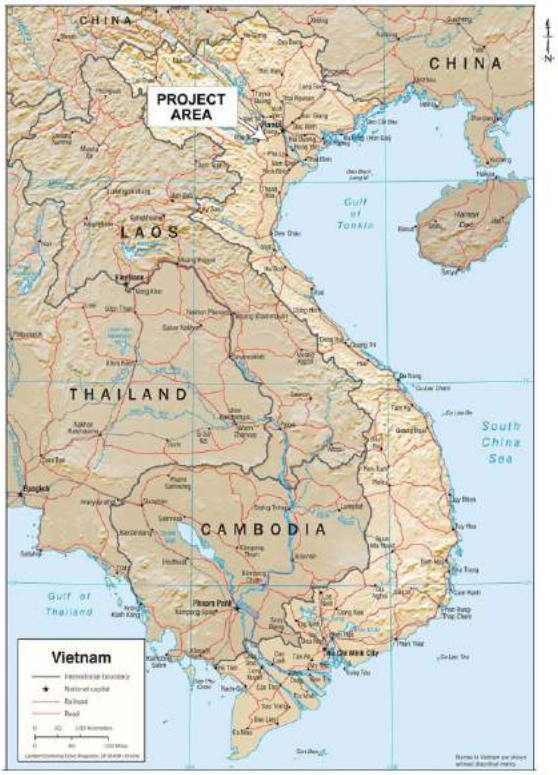


Figure 1 - PROJECT AREA MAP
Vietnam Project 7244

Click on Map to Enlarge

Note: For best viewing of enlarged figures, download the Report PDF file to desktop and open.

This report is to be used by WBG management as an independent assessment of the mining development potential of the subject properties and, if I2M's assessment and other in-country factors and associated risks are deemed acceptable by WGB management, to enter into a joint

venture with a Vietnamese mining company and to fund further development and expansion of the subject mining operations.

Section 3.0 Introduction

The conclusions and representations proffered in this report have been prepared based on I2M's review of the available internal documents received from WBG management. Additional information (reports, maps, etc.) was obtained during I2M's visit to Vietnam in January, 2014 from various Vietnamese governmental agencies, from the available geoscience literature available online, and from the files of I2M in Houston, Texas, and Seattle, Washington. Also, geological samples were obtained during the field visit and were subsequently examined and described in the field macroscopically by hand lens and in hand specimen, and in the laboratory via analysis for their elemental content and by thin-section petrological investigations to reveal the geological and geophysical associations that may be related to the associated precious- and base-metal mineralization.

Mr. Michael D. Campbell, P.G., P.H., I2M's Chief Geologist, accompanied by Mr. M. David Campbell, P.G., Senior Geologist for I2M, departed the U.S. for Hong Kong and Hanoi, Vietnam on January 14, 2014. They were joined by senior members of WBG management consisting of CEO, Mr. Richard Poulden, and CFO, Mr. Clive Hyman, and In-Country Project Representative, Mr. Trevor Lindstrom, in Hong Kong and traveled on to Hanoi, Vietnam. They were met at the Hanoi Airport by additional in-country representatives and interpreters.

I2M personnel carried out the following primary tasks while in Vietnam:

- Held initial discussions with WBG management regarding their perspectives, with special emphasis on the purpose of the visit and the role of the I2M investigation.

- Held continuing discussions during the period with in-country geological consultants, Nguyen Dac Lu, Ph.D., General Director, Saonam Mineral Group, and Hai Thanh Tran, Ph.D., Associate Professor of Geology at the Hanoi University of Mining and Geology, and associated interpreters and industry and governmental officials.

- Obtained information via maps and other reports regarding the subject area of interest where gold mining operations are currently occurring, and where gold and other metals have been reported in outcrop in the past.

- Held meetings with district and local Government officials regarding the available geological and geophysical mapping and associated reports covering other subject areas.
- Obtained geological samples for laboratory and petrographic studies to assess elemental and mineralogical contents of selected rock samples.
- Assessed and evaluated the degree and stage of the mineralization involved in gold deposition and the potential for having deposited orebodies of economic significance in the area.
- Assessed the potential for expanding the current mining operations.

The objective of the I2M investigation was to provide an independent and impartial assessment of the mineral potential of the subject area of interest including the current mining operations that were offered by a local gold mining company as part of a potential joint venture with WBG , i.e., the lease areas Hop Hoa and Vai Dao (see Appendix I), and the Lang Sen deposit, an area of recent potential interest, among other areas introduced during the I2M field visit.

3.1 Units and Terminology

A list of standard abbreviations (Appendix II) and a glossary of technical terms (Appendix III) have been included to define and explain various technical terms used in this report. The Metric System is the primary system of measurement and length and is generally expressed in kilometers (km), meters (m), and centimeters (cm); volume is expressed as cubic meters (m^3); mass is expressed as metric tonnes (t); area in hectares (ha); and laboratory analyses are reported as elements or are converted to oxide percent in parts per million (ppm). Grams per tonne (g/t) is an equivalent unit to ppm. One tonne is the equivalent of 1,000 kgs (2,204.6 lbs). Monetary units are treated as U.S. Dollars. Mining and mineral acronyms in this report conform to mineral industry-accepted usage.

3.2 Climate and Seasonal Operations

The areas of interest are located in a tropical climate and experience two distinct seasons: dry and rainy seasons. The rainy season extends from April to August each year. Heavy flooding or landslides can be expected from time to time that will occasionally obstruct or delay traffic until roads are repaired. Because local inhabitants generally live in the valleys and hills surrounding the rice paddies, limited assistance is readily available.

During the rainy season, the highest temperature can reach 36° C, with the lowest anticipated to be approximately 16° C. The dry season begins in September and extends to March of the next year. The dry season extends from October to December, with temperatures down to about 5° C warming up from December to March, usually including drizzle and fog.

3.3 Accessibility to the Mining Properties

The areas of interest are located approximately 40 kilometers southwest from Hanoi. Access to the properties is possible by roads ranging from highways to improved roads along rice paddies (see Figure 2) to dirt roads in the mountainous areas that must be repaired by bulldozers from time to time after heavy rains. The topography of the areas along the access roads vary from gentle slopes in the high valleys (see Figure 3) via switchbacks to inclined roads requiring four-wheel drive vehicles. The roads observed by the I2M field team allowed small-haul trucks to pass with some difficulty. The topographic maps presented in Appendix IV illustrate the topography of the subject and surrounding areas.

Figure 2 – Valley Rice Paddies and Limestone Inselbergs along the way to Subject Properties

3.4 Local Resources

Communes and small villages are numerous in the areas of interest and can provide some of the basic needs. The larger villages connected by maintained roads and secondary roads have a

greater range of supplies, repair shops, and medical facilities. Electricity is widely available and telephone cellphone towers are available along the primary roads. Water for commercial use is widely available as well as bottled drinking water.

Figure 3 – Secondary Roads Showing Isolated Communes in the High Valleys

Section 4.0 Source of Geological and Mining Data

The technical documents made available for review during this investigation are for the most part in Vietnamese and required translation by I2M personnel. Summary reports in English were obtained by WMG management and passed on to I2M for review, e.g., Nguyen Dac Lu, "Brief Outlines on Gold of Vietnam," (No Date) provides general information on the subject areas. Dr. Lu also provided a number of maps and reports, sections of which have been translated for use in the I2M investigations. A number of reports were also identified during meetings with the local government's district geological and mining survey officials, who were especially helpful in providing introductions to the local geology and previous mining activities in the area (see Figure 4).

Figure 4 – Meetings at the Vietnamese District Geological and Mining Survey Offices.

The Vietnamese documents reviewed (and translated in part) have been cited in Section 16.0 References of this report.

Section 5.0 Gold Mining in Vietnam

Gold mining has been conducted in Vietnam for more than 2,000 years. Over the years, gold was mainly mined from so-called placer deposits within some local streams and rivers. The data on such operations prior to the 1950s are scarce or incomplete. From 1962, new gold occurrences have been discovered and mined on a limited scale by local miners. Recently, under State management and funding, the Geological Survey of Vietnam and other State agencies have funded and conducted reconnaissance geological mapping and outcrop sampling, along with geophysical programs in some areas, mostly by ground magnetic surveys. The use of the magnetic surveys in exploration is illustrated in Figure 79. Leu (2010) reports that at least 10 new so called "gold zones" or outcrops have been located to date in the area of interest, in addition to those already known from previous mining activities. Of course, the grades, and horizontal and vertical extent of the mineralization in these areas remain to be tested by drilling but funding has not been available. Some of these zones are apparent in the maps in Appendix I.

5.1 Previous Exploration and Mining

The general area of interest has experienced only superficial exploration for gold and other commodities. This is partly because the heavily oxidized zones exposed at the surface in a number of areas contain micro-fine gold that went unrecognized by local inhabitants and the earlier exploration activities by the French. Even after excavating below or into the oxidized zone, the sulfide-gold mineralization contained refractory ore that could not be processed without advanced metallurgical methods of extraction. Only gold eroded from these types of deposits made its way into streams and rivers forming placer gold deposits recognized and recovered by simple gravity methods.

The two areas of interest offered to WBG management as a joint venture (i.e., Hop Hoa and Vai Dao) were originally discovered by Division 8 of the Vietnam Geological Survey in 1987 (see Report #4 in Section 16.0 References). Geological mapping and geophysical surveys were subsequently conducted and indicated shallow mineralization of potential economic value. A few

exploration holes were drilled and these intersected highly dipping mineralized zones that extended some distance from that sampled in outcrop nearby. Once the strike and dip of the zone was defined, adits were driven into the side of the hills. Once the mineralized zone was encountered, mining began by a Vietnamese mining company. Mining operations at the Hop Hoa mine were underway in January, 2014 during the I2M field visit, which allowed sampling of the ore being produced at that time. The Vai Dao Mine has not been producing for many years. Samples from the Vai Dao Mine were obtained from the dump of the old mine (see Section 7.0 for additional information on the I2M sampling of the mine areas and of other areas).

5.2 Other Exploration and Mining

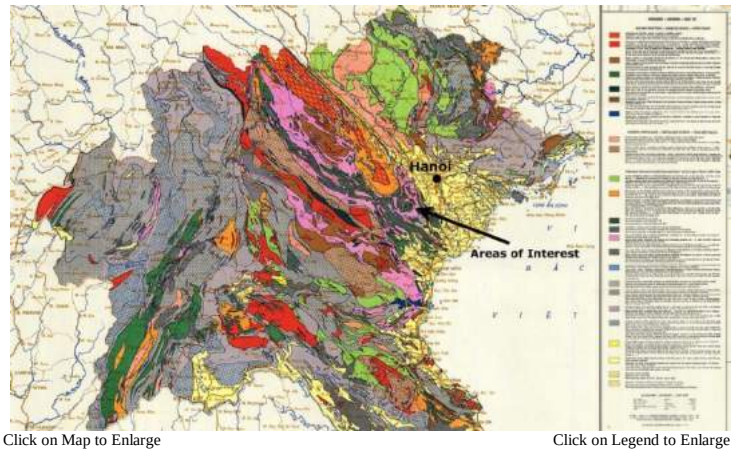
There are no other known gold or other metals exploration or mining operations currently underway in the immediate area. There are four projects that I2M personnel have become aware of that are in various stages of development. One is the Nam Thuong Mine that produces gold via adit development on a reportedly small scale. It is a joint venture between Hoa Binh THT Minerals Mining, LLC and Fidelity Ventures Pty Limited (Australia). Another project is the Ban Phuc Nickel Project by Asian Mineral Resources Limited (Canada) in Son La Province located more than 50 kms to the west. It is near production status.

Another prospect is the Ba Dinh Gold Project located about 8 kms east of the Hop Hoa Mine. It is a project by the Ba Dinh Investment and Construction Consultancy JSC (Hanoi) in an area that has been mined by artisan miners for many years on a limited scale. Mineralization is associated with the Devonian limestones that have been fractured and faulted and invaded by hydrothermal solutions. Gold and silver as well as lead and zinc minerals are common in this area (Alief, 2009). The fourth project is the Lien Son gold project located about 20 kms to the south, which is in an advanced stage of planning and permitting.

The largest gold mining operations in Vietnam are conducted by Besra Gold (more). The group is currently producing gold and byproducts of silver, lead, and zinc from their Phuoc Son Mine, an underground operation located southwest of Da Nang in central Vietnam. An open-pit operation at their Bong Mieu Mine located south of Da Nang is not currently producing.

Section 6.0 Geology of the Area of Interest

The large-scale Song Da structure dominates the geology of northwest Vietnam (see Figure 5). The Cao Ram area lies east of the Doi Bu village, which lies on the eastern edge of a large circular structure visible at high altitude.



Click on Map to Enlarge Click on Legend to Enlarge

Figure 5 - The Song Da Structure and General Geology of Subject Properties Investigated

East of the village of Cao Ram is an area characterized by a smaller oval structure covering an area of about 15 km^2 located about 40 kms from Hanoi (see Figure 6). In general, the central part has been uplifted into a domal structure and is composed of volcanic rocks surrounded by faulted sedimentary rocks. The volcanics are mapped as the South Vien Nam Formation (designated as T1VN on geological maps of the area, see Figures 7A and 7B).

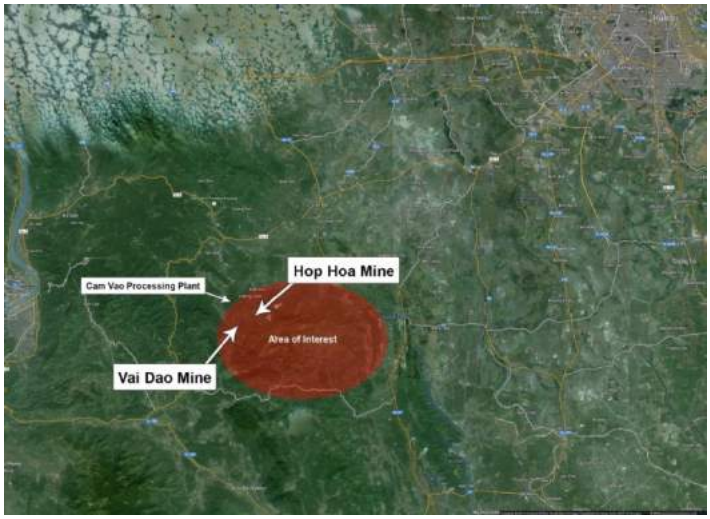


Figure 6 – General Location of Primary Area of Interest
Click on Map to Enlarge

Gravity surveys indicate that this uplifted dome is reflected by basement structures. According to the interpretation of geophysicists, there are intrusive bodies of mafic and mafic-intermediate composition at depth intersected by fault systems of NW-SE and conjugant NE-SW strike.

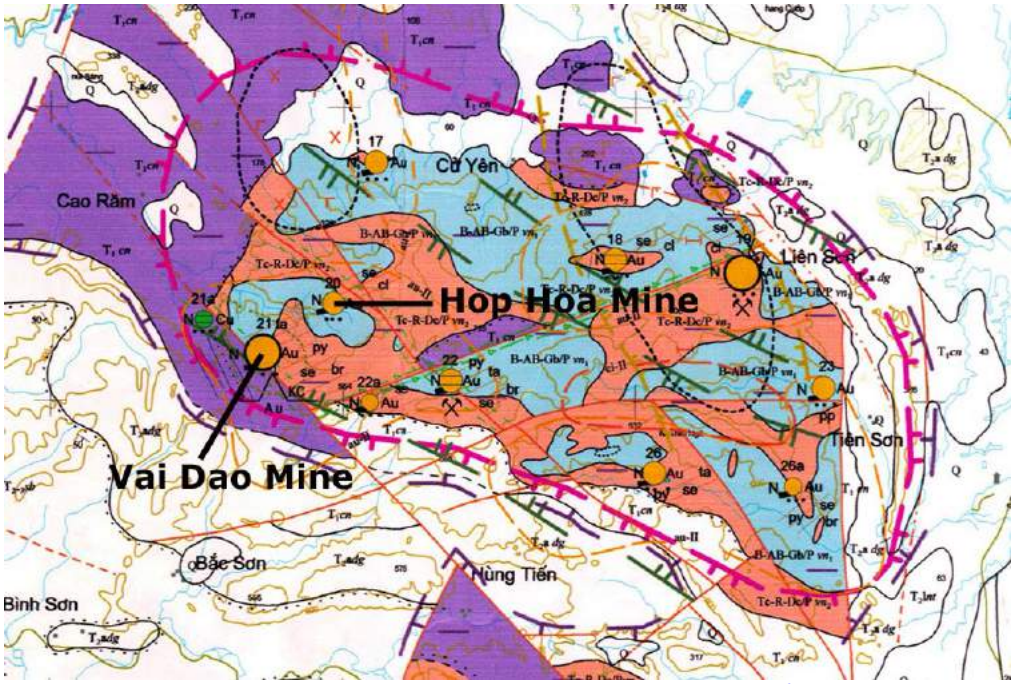
Based on information provided by Nguyen Dac Lu, Ph.D., and Hai Thanh Tran, Ph.D., geological information produced by the Vietnamese Geological Survey and affiliated government offices that covers the Doi Bu District, and that includes the subject Cao Ram area of interest, a number of reports and maps are available covering the following topics:

- Geological mapping (1/50,000 scale) and published as Ha Dong – Hoa Binh Map Sheet, 1989),
- Petrographic-Structural Sketch-Map (1/10,000 scale) of Vai Dao Mine location, 1992,
- A report on the composition and ore processing of sulfide-gold ore from Cam Vao Plant, Hoa Binh province, 1992,
- Reports on the sulfide-gold ore of the Cao Ram Area - Doi Bu District and Luong Son District, Hoa Binh Province, 1993,
- Supplemental investigations of sulfide-gold ore in the Doi Bu, Luong Son, Hoa Binh Province, with an emphasis on composition, origin and distribution of sulfide-gold ore in the Doi Bu area, 1998,
- Reports on the geochemical modeling of gold mineralization of the Doi Bu area, with an emphasis on modeling of geochemical anomalies for use in geological mapping and mineral resources investigation in Vietnam, 2000,
- Reports on the relationship between volcanic rocks within the Song Da Structure, Vien Nam area and gold and copper ore mineralization, 2005,
- Reports on the composition, genesis and distribution law of gold ore in the Doi Bu – Suoi Chat area, 2007,
- Russian report by Narxev, 1989, on mineralization involving silver-lead-antimony and zinc-copper-cobalt mineralization in the general area, and
- Russian report by Grigorian X.V., 1980, on silver-lead-zinc and copper-cobalt-bismuth.

The above maps and reports are all in Vietnamese, sections of which have been translated and cited in Section 16.0 References. The above latter two references are in Russian but were not available for review.

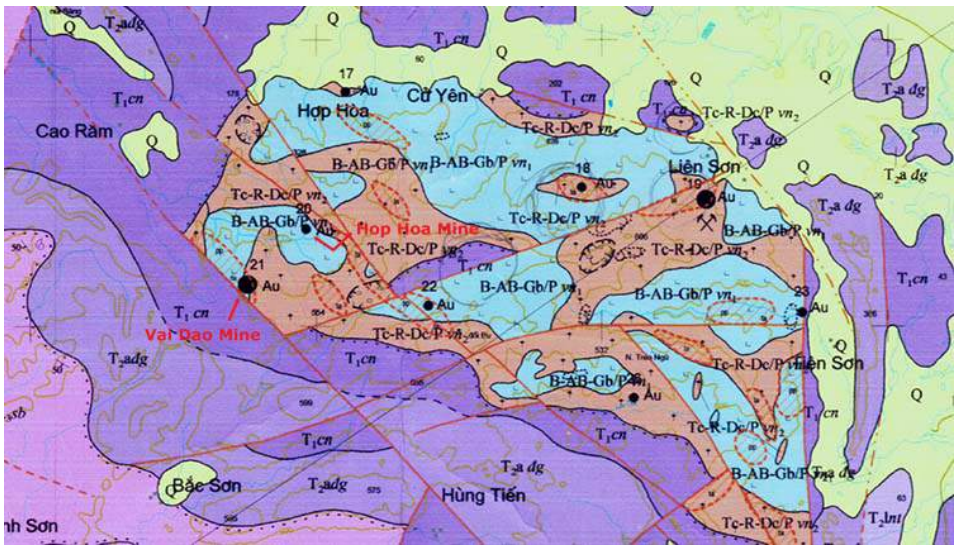
The above publications provide a foundation for understanding the geological conditions that have produced mineralization of potential economic value. Area-wide and local geological and geophysical (magnetics) mapping programs have been conducted in the Doi Bu area by the government on selected areas, two of which were on the Hop Hoa and Vai Dao areas, which have resulted in the current small-scale mining operations in one of these areas. Appendix I includes the results of the programs for the subject areas as well for other areas that illustrate the potential for gold mineralization at or near the surface. There are comprehensive drill logs for some of these areas. They are all in Vietnamese but gold grades, depths, and locations can be ascertained by the English reader.

Gold-bearing quartz and sulphide veins are associated with the principal NW system but also with minor associated faults off of the main faults (see Figure 7A and 7B). To view the figures in greater detail and for explanatory legends of terms and symbols in the maps, click on either figure to enlarge. The two areas of interest (Hop Hoa and Vai Dao) are shown on both figures.



Dated: 2003 Metallogenic Map: http://www.i2massociates.com/Downloads/VungVienNamGeologicMap.pdf Click on Figure to Enlarge

Figure 7A – Metallogenic Map of Subject Mining Properties



Dated: 2003 Geologic Map: http://www.i2massociates.com/Downloads/RegionalGeologicMapII.pdf Click on Figure to Enlarge

Figure 7B – Geologic Map of Subject Mining Properties

The reports by Russian geologists (Narxev, 1989, and Grigorian X.V., 1980) cited above and in Section 16.0 References, indicate that the mineralized zones in the Doi Bu area have been only partially eroded, while in areas nearby, the mineralized zones have been eroded more deeply into the zones than in the Doi Bu area. This suggests that the sulfide mineralized zones are in place and available in the shallow subsurface in the Doi Bu area. Of course that also suggests that because the subject areas have been uplifted as a dome more so than surrounding areas, they have likely been in a tropical, high rainfall, climate for millions of years that has eroded the topography into the steep and unstable hillsides that could restrict access during the rainy seasons. The thickness of the oxidized mineralized zones has been extensively eroded in some areas, resulting in the widespread occurrence of placer gold down gradient in streams and nearby by rivers of the area. This is one indication that potentially economic sulfide, quartz vein, and oxide ore may be present in significant tonnage and grade to justify major exploration programs in the area at depths not yet explored in the Doi Bu District.

6.1 Target Formations in the Cao Ram Area

The geological formations in the Cao Ram area covered in Figures 7A and 7B involve the following: 1) Vien Nam volcanic complex (Gb-B-AB-Tc-R-Dc/P *vn*), 2) Co Noi Formation (T_1*cn*), 3) Dong Giao formation (T_2a*đg*), and 4) Quaternary (Q) sediments. Such as:

1) **The Vien Nam Volcanic Complex** (Gb-B-AB-Tc-R-Dc/Pvn)

Various units of the Vien Nam Volcanic Complex occupy parts of the Doi Bu uplifted dome (65% of the area), occurring mostly near or at the top part of the dome. These are the oldest formations in the region. Based on geological relation and composition, the Vien Nam Complex can be divided into two phases:

- The First Phase: basalt, tuff basalt, diabase, gabbrodiabase including a) extrusive facies, b) extrusive eruption facies, and c) a subvolcanic facies:

    a. Extrusive facies: includes fine-grained basalt, massive basalt and basalt porphyry.

    b. Extrusive eruption facies: The rocks of this facies are not well developed, but include tuff basalt, and a tuff with andesite basalt. The outcrop debris consists of angular fragments of basaltic composition, with plagioclase crystalline scree. The rock cement consists of fine-grained volcanic fragments with chlorite, epidote, chalcedony.

    c. Subvolcanic facies: Large veins penetrating basalt and tuffaceous rocks are of subvolcanic origin, usually ranging from 2-3 up to 30 meters thick and have penetrated surrounding rocks. These bodies are mainly composed of diabase, gabbrodiabase and their oxidation products.

- The Second Phase: Rocks of this phase occur at the top of the dome, the rest for beds that appear to radiate from the higher elevations. They consist of alkaline felsitic rocks (with trachyte, rhyolite, trachyandesite, trachydacite, and trachyrhyolite).

    a. Extrusive facies include trachyte, rhyolite, and trachyrhyolite.

    b. Extrusive eruption facies include tuff trachyte, tuff rhyolite, and tuff trachyrhyolite.

    c. Conduit-eruption facies include agglomerate, tuff agglomerate, trachyte porphyry, and rhyolite porphyry.

    d. Subvolcanic facies include trachyte porphyry, rhyolite porphyry, and trachyrhyolite porphyry.

Nguyen Dac Lu indicates that the gold occurs in both the volcanic rocks of basic composition and in those of subalkaline composition (trachyte) of the Vien Nam Formation (Pvn unit).

2) **The Co Noi Formation** (T_1cn)

This rock unit is exposed in the form of narrow belts surrounding the flanking parts of the domal structure (see Figures 7A and 7B). Typical lithologies consist of thick-bedded (20-40 cm) sandstone tuff, argillite tuff, violet, violet brown clayey schist mixed with thin-bedded, fossiliferous limestone.

3) **The Dong Giao formation** ($T_2a\đ g$)

This unit is of limited distribution in the SW, E-SE corner of the domal structure (see Figures 7A and 7B), and includes black, and grey to light grey, thin-to-thick-bedded limestone, which grades into the Co Noi Formation.

6.2 Impact of Structural and Tectonic Forces

The impact of structural and tectonic forces are of major importance in localizing any intruded metals, whether that be gold, silver, zinc, nickel or other metals that have been reported in the general area. The geographical location of the region is in a major rifting zone associated with the Song Da structure mentioned earlier (see Figure 5).

It is well known now in the area that gold ore bodies occur in veins of tension fractures developed at the same time the target units were extruded as brittle-pliable (viscous) to pliable ore sub-brittle sliding zones. Although there is a differentiation according to deformation depth (from brittle to pliable), these high deformation zones occur in association with reverse and/or strike-slip faults. Such zones play an important role in the injection of mineralizing fluids containing gold and other metals in tension-fracture vein systems.

Pulses of hydrothermal solutions circulating in the rocks when encountering tension fractures and their feather extensions into the host rock, under favorable conditions, can be re-crystallized to form large scale stockworks in the faulting zones. Gold occurrences in the subject areas are mainly concentrated along reverse fault zones and/or strike-slip fault zones primarily along a NW-SE direction with some occurrences along NE-SW and sub-parallel directions. This is confirmed in Figure 7A and 7B.

Further, Nguyen Dac Lu reviewed gravimetric surveys and suggested that they indicate that very high-density rocks exist at shallow depths in the domal area east of Cao Ram. Very large positive magnetic anomalies have been reported that indicate intrusive rocks, such as granodiorite or granite, may exist at shallow depths and that they likely provided the gold and other metals to the volcanic eruptions on land or to the bottom of a shallow marine environment. This is significant because other gold producing areas in the world exhibit similar geological and tectonic conditions (more). Applying such analogies to the Doi Bu and Cao Ram area would be particularly appropriate and useful in assisting future exploration.

Section 7.0 Sampling in the Areas of Interest

Gold ore in the Doi Bu area has been described as vein-form gold-quartz-sulphides including two types of mineralization: as gold-pyrite (see Figures 8A and B) and gold-sulphides (See Figure 9).

7.1 Previous Geological Sampling of Mineralized Zones

In the Vai Dao area, eight (8) veins, with ore trends of 80 to 365 meters in length have been reported with a thickness of 0.6 to 4.5 meters in width. Average gold content in the ore zones from this area were reported to range from 1 to 7.6 g/t. Since there is only limited drilling data for the area, any estimate of the resource base is speculation. The basis for the estimates of Vai Dao, Hop Hoa, and other areas are provided in Appendix I.

Figure 8A - Quartz Vein with Massive Pyrite
(From Hop Hoa Mine)

Figure 8B – Quartz Vein with Euhedral and Anhedral Pyrite and Pyrrotite (magnetic)
(From Vai Dao Mine Dump)
Click on Figure to Enlarge

Figure 9 – Gold-Sulfide (Pyrite and Pyrrhotite) Ore in Quartz Breccia
(From Lang Sen area)
Click on Figure to Enlarge

Another type of ore exhibits a stockwork of quartz breccia with partially weathered sulfide ore. This type of ore was likely formed by rapid injection of mineralizing fluids containing gold and other metals and iron-rich constituents into fault zones. The minerals associated with the mineralized zones are indicated in Table 1.

Table 1
Minerals Associated with Mineralized Zones in the Doi Bu Area*

Mineralized Zones		Gangue Minerals	
Primary	Secondary	Hydrothermal Minerals	Dike Minerals
Pyrite	Goethite	Chlorite	Quartz
Arsenopyrite	Hydrogoethite	Epidote	Calcite
Galena	Anglesite	Sericite	Chlorite
Sphalerite	Coveline	Ankerite	Epidote
Chalcopyrite	Chalcosine	Calcite	
Native gold	Malachite	Feldspar	
Electrum	Azurite		
Pyrrhotite	Bromite		
Bornite	Svanbergite		
Bronze	Pyromorphite		

* Note: Modified from table in Nguyen Dac Lu, No Date, "Brief Outlines on Gold of Vietnam," 15 p

The reported characteristics of the mineralized zones in the Vai Dao, Hop Hoa, Land Sen, and from another site at some distance from the subject area are summarized in Table 2.

Table 2

Previously Reported Characteristics of Mineralized Zones*

Sampling Sites Reference #	Name & Area of Mineralized Zones	Average Gold Content (g /T)	Length of Mineralized Zones(m)	Thickness of Mineralized Zone (m)	References and Source of Data
1	**Vai Đào** 2km^2	4.04	120	4.50	Hào:17,33,79 Điểm lộ: ĐL.1,2 LK. 2
2		3.55	138	0.85	Hào 47,91
3		1.00	80	0.92	Hào 53
4		7.64	365	2.28	Hào 6,7,52,93; lò 1 G.1; LK. 1
5		2.90	82	0.87	H.83
6		1.00	94	0.63	H.93
7		2.20	54	1.00	H.82
8		1.00	90	0.57	H.76
9	**Làng Sen** 2.3 km^2	2.75	52	2.00	ĐL.2826; H.439
10		4.60	120	0.79	H.406
11		8.18	127	1.16	H.408; 412
12		6.70	32	0.78	H.419
13		2.30	31	0.67	H.409
14		6.80	87	0.60	H.409
15		3.23	84	2.03	H.409
16		4.32	117	0.80	H.409
18	**Hop Hòa** **2.0 km^2**	2.30	94	0.88	H.118
Near-By Area					
1	**X. Vần** 3.5 km^2	0.50	100	3.74	H.45
2		8.00	100	1.20	H.45
3		2.79	530	9.62	H.22; G.19; 9 VL.10-3; 11; 4029 L.6; 50
4		4.29	400	2.11	H.22; G.19; 9 VL.10-3; 11; 4029 L.6; 50

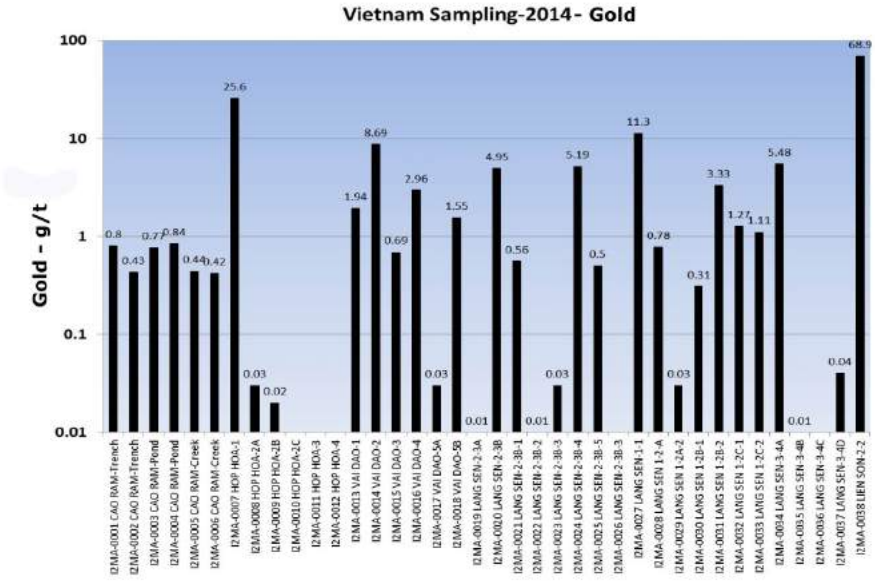
* Note: Modified from table in Nguyen Dac Lu, No Date, "Brief Outlines on Gold of Vietnam," 15 p.

7.2 Geological Sampling by I2M - 2014

The sampling program by I2M personnel is summarized in the following discussions. These include the samples obtained from the Hop Hoa, Vai Dao, Lang Sen, and Lien Son areas, and tailings from the Cam Vao Processing Plant. Thirty-two (32) rock samples and six (6) tailings samples were evaluated, selected, and transported by I2M personnel to the ALS Minerals Laboratory in Reno, Nevada, and Vancouver, Canada for a 48-element scan, trace-mercury analysis, and gold-grade analysis. The results are presented in the ALS Minerals Certificate of Analysis #RE14018921, dated February 24, 2014 (see Appendix IV). There have been no revisions/corrections of the data by ALS to date. Sample locations are indicated on the topographic maps in Appendix V.

Laboratory results for all gold values are illustrated in Figure 10 in grams/ton (g/t). Please note that the samples were selected to represent a range of conditions in and around the mineralized zones that are being mined or were visited, and hence do not represent either the mine's output or the mineralized zones visited. Systematic sampling at the mine face and across the zones visited at a number of locations would be required to appropriately represent the mineralized zones at those locations. Drilling would be required to develop the horizontal and vertical dimensions of any particular mineralized zone before a sense of a mine's reserves and resources could be established. The random sampling by I2M does indicate that gold is present at grades of potential economic interest.

Figure 10



Click on Figure to Enlarge

To assess the extent of mineralization (of all metals, etc.), each sample selected for detail evaluations below include: 1) the field photos of the samples, 2) the field description of the samples, 3) the number of geochemical anomalies and a list of anomalous elements with the associated values, and 4) the petrographic descriptions of selected samples with photo-micrographs.

7.3 Geochemical Anomalies

The laboratory results of the 48 element scans (plus mercury, and gold in terms of grams/ton (g/t)) have been evaluated by I2M personnel to identify any geochemical anomalies present in the samples. Such anomalies are of use in assessing the relative value of exploration projects. The anomalous values were identified relative to the I2M sample population only.

The number of anomalies in any particular sample is a guide to the proximity of the primary mineralizing fluids when the hydrothermal systems originally injected the fluids containing the metals and associated constituents in solution into the fractures and joints. Subsequent alteration of the metals by later hydrothermal fluids of especially low pH may solubilize the metals again, and/or change the valence of the elements, but the metals would typically remain in place or be dispersed nearby. Erosion at the surface, of course, would re-distribute the gold and silver (if in the form of electrum) and other heavy minerals such as magnetite in placer deposits of streams and rivers downgradient.

Certain alteration features found in outcrop are especially important indications of subsurface mineralization and of the possible local magnitude of precious-metal mineralization. Processes that affect volcanic rocks, such as propylitization (due to heated solutions given off by intrusives from granodiorite or granite at depth) are often involved in post-volcanic injection of veins. When combined with the other features of the rock in faulted zones, such as the alteration of feldspars and chlorites, and other silica flooding of the vugs in the volcanic rocks, they serve to indicate ore proximity. All of these features have been reported in the area of interest, some of which have been reported in the samples evaluated for this investigation.

7.4 Geological Sampling Sites

Certain rock samples were selected by I2M personnel for petrographic analysis for the purpose of developing an independent assessment of the mineralized rock samples that represent a range of rock types and degree of mineralization. For the Hop Hoa and Vai Dao samples, the first two in the series were selected as likely gold ore samples (e.g., Lab # I2MA-0007-0008 (Field Name: HOP HOA-1 and -2); and Lab # I2MA-0013-0014 (Field Name: VAI DOA-1 and -2)).

Figure 11 – Portal to Hop Hoa Mine

Figure 12 – Inside Hop Hoa Adit

Figure 13 - 300 Meters into Hop Hoa Mine

Figure 14 – Mining Face at Hop Hoa Mine. Note Pyrite Reflections

Figure 15 – Hop Hoa Mine Face. Sulfides Note Mineralized Veins in Quartz
(Click on Figure to Enlarge)

Figure 16 – Hop Hoa Mine Face. Partially Oxidized Ore

Figure 17 – Hop Hoa Ore for Processing

Figure 18 – Mr. Trevor Lindstrom (In-Country Representative), Mr. Richard Poulden (CEO, Wishbone Gold Plc), and Mr. Campbell (I2M Associates, LLC), with Mine Manager and Interpreter, (left to right)

Figure 19 – Vai Dao Mine Portal Mr. Campbell

Figure 20 – Vai Dao Mine & Dump. Interpreter & Mr. Poulden

For the Lang Sen area, the site's recently excavated pit exposed fault-related mineralization. At least 10 truckloads of "ore" samples had been trucked out of an otherwise dangerous pit with unusually high headwalls to staging areas near the top of the hill. I2M personnel selected a number of samples for elemental analysis and thin-section study.

Figure 21 – Area of Lang Sen Deposit before Pit was excavated (Red Outline) Stop 3 Staging Area Sampling Site. Trench Mapped Fault to West.

Figure 22 – Lang Sen Pit. Looking West. For Scale Contact. Note Personnel at Bottom and Highwalls.

Figure 23 – Lang Sen Slickensides from Fault

Figure 24 – Fault-Zone Mineralization Heavily Oxidized and Gold-Bearing

Figure 25 – Fault-Zone Mineralization Showing Contact (Red Line)

Figure 26 – Quartz Breccia with massive Chalcopyrite and Pyrrhotite

Figure 27 – Field Team at Lang Sen Pit.
Mr. Lindstrom, far left.
Client, center back.
Mr. Hyman, center red.
Mr. Campbell, far right.

Figure 28 – Composite Sample across Mineralized Zone at Lien Son Site.

Section 8.0 Petrology of Selected Samples

John L. Lufkin, Ph.D., Golden, Colorado, Consulting Petrographer, in cooperation with Samuel W. Romberger, Ph.D., an I2M Associate, also of Golden, Colorado, prepared the thin sections of the samples selected by senior I2M management. The results of the petrographic study are presented below on 13 polished thin sections and associated samples.

In general, the sample suite is dominated by strong silicification and lesser iron oxidation. Most of the rocks show one or more of three types of veining, including 1) quartz-pyrite, 2) carbonate,

and 3) chlorite, in order of decreasing abundance. Sulfide minerals include pyrite, the most abundant by far, followed by chalcopyrite, pyrrhotite, and covellite. Free gold (electrum) was noted in Lab # I2MA-0007 (Hop Hoa-1) - a grain less than 150 microns in length. Several sections also contain finely disseminated magnetite, which has been generally oxidized to hematite and limonite, and other oxidation products.

The original parent rock was difficult to determine due to the strong silicification. The exceptions include Hop Hoa-2A and Hop Hoa-4. Hop Hoa-2A is a strongly foliated and limonite-stained metamorphic rock lacking mineralization. This is significant because the metamorphic rocks may have been rifted up from great depths where mineralizing fluids from intrusives and extrusives may have collected metals on the way up to be injected into fractures and joints in the rocks above, which now occur at the surface as a result of erosion over millions of years.

Hop Hoa-4 appears to represent a granitic intrusive rock, which is significant because earlier gravimetric surveys suggested the possible presence of plutonic (or intrusive) rocks at depth below the outcropping rocks discussed above. These would serve as likely sources of the metals reported in the shallow subsurface and confirms that the area is a significant metallogenic location with the potential of offering multiple sites of precious and base metal mineralization of economic importance.

8.1 Paragenesis of Mineral Deposition Sequence

Paragenesis, or the sequence of mineral deposition, was very difficult to determine in the I2M suite of samples, due to the lack of cross-cutting relationships exhibited in the samples selected for evaluation. Additional samples would need to be examined before the paragenesis of the mineral formations can be determined. For the one section containing chalcopyrite and covellite together, it is clear that the covellite has replaced the chalcopyrite, and therefore, is younger. Pyrrhotite and chalcopyrite were observed together in one section, but the paragenesis of that pair is inconclusive, again because of a lack of mineral contacts. Magnetite and hematite are commonly associated together, and hematite almost universally is an oxidation product of magnetite in hydrothermal deposits.

A Vietnamese paragenesis study confirms, in part, what the preliminary I2M study indicates. The Hop Hoa mineral assemblage is showing high-temperature formation, which implies deep connections, while the Vai Dao mineral assemblage formed at lower temperatures, which includes sulfide formation. The samples containing oxides of iron and other metals formed at even lower temperatures near the surface. Note that the gold (i.e., "Vang" in Figure 29 below) accumulated over a range of temperatures in the mineralizing fluids (see Report #6, pp.76-78).

8.2 Supporting Data on Mineral Deposition Sequence

Nguyen Dac Lu conducted a series of studies using lead-isotopes, sulfur-isotopes dating $\delta^{34}S_{Cdt}$, $\delta^{18}O_{SMOW}$, composition of CO_2, NaCl, temperature (T) and pressure (P) in mineral inclusions which show that the gold mineralization in the Doi Bu-Suoi Chat area was formed 155 to 123 Ma ago during the Late Jurassic to Early Cretaceous.

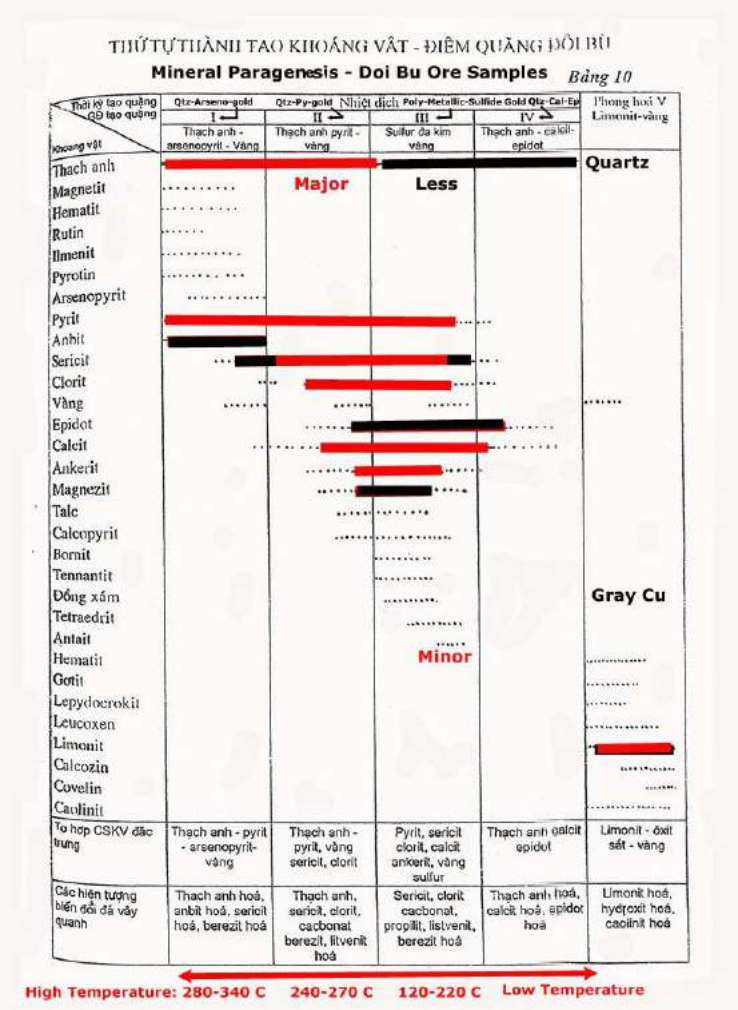


Figure 29 – Mineral Paragenesis – Dui Bu Area
(After Report #6 Figure)

This was a result of hydrothermal activity occurring over a temperature range from 315° C to 216° C at pressures from 1070 to 1090 bar. The research results also indicate that the gold mineralization was formed in a compression, orogenic setting. This is consistent with the mineral paragenesis summarized in Figure 29 from sample areas in the Doi Bu District, and with the petrographic descriptions and mineral assemblages of the samples collected by I2M discussed below. The above information on paragenesis, combined with the other data in this report, forms the basis of a comparison with other known major gold ore bodies in the world, which in turn helps to determine if the Cao Ram area mineralization has the potential to be of economic significance.

Section 9.0 Macroscopic, Elemental and Petrographic Descriptions

9.1 Hop Hoa Mine Area

<u>Hop Hoa-1</u>

Rock is brecciated, silicified, and contains patches of yellow-brown limonite. Silicification is dominant, with at least two generations of quartz veins containing pyrite. Much of the pyrite, euhedral to anhedral, is highly fractured and broken that yields a poor polish. This sample contains visible gold – as one grain approximately 147 microns in length.

Locally, intergrown chalcopyrite (cp) and covellite (cv) are present. The chalcopyrite is altered and replaced by covellite (Figures 30-33).

Sample Hop Hoa-1 Geochemical Anomalies: 5 Geochemical Index Rank: **11th**

Au = 25.6 g/t Ag = 1.12 ppm As = 199 ppm Mo = 25.1 ppm S = 10,800 ppm

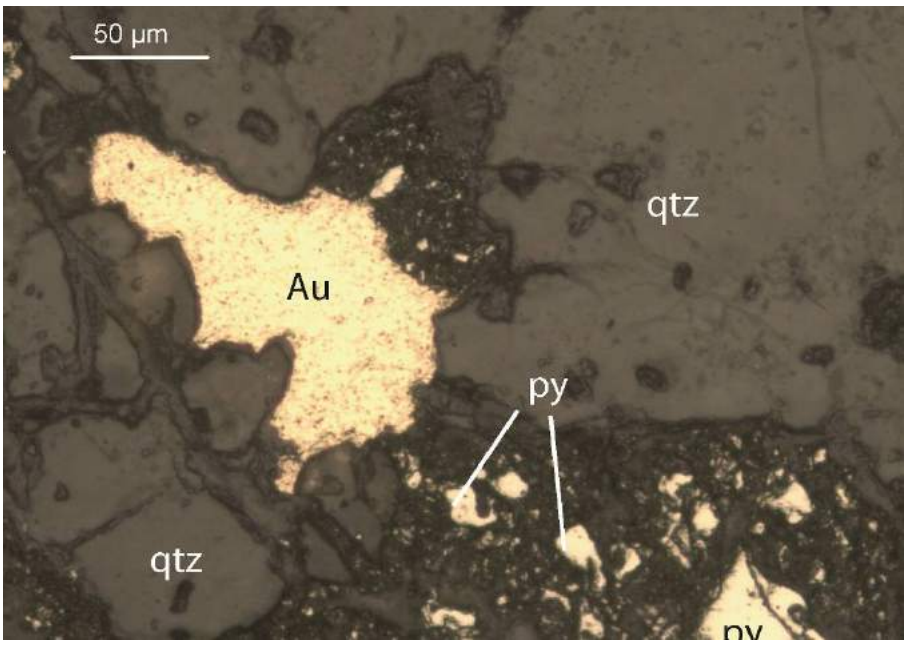


Figure 30 - Hop Hoa-1. Grain of native gold, about 147 microns in length. With pyrite fragments in granular iron-stained clay. Reflected light, uncrossed polars.

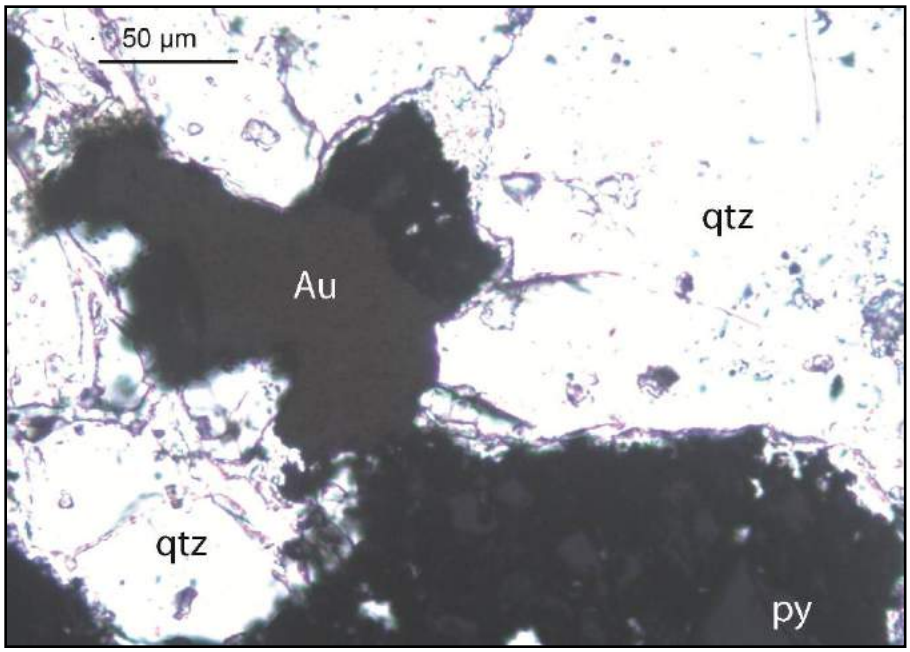


Figure 31 - Hop Hoa-1. Same as above; transmitted light, uncrossed polars.

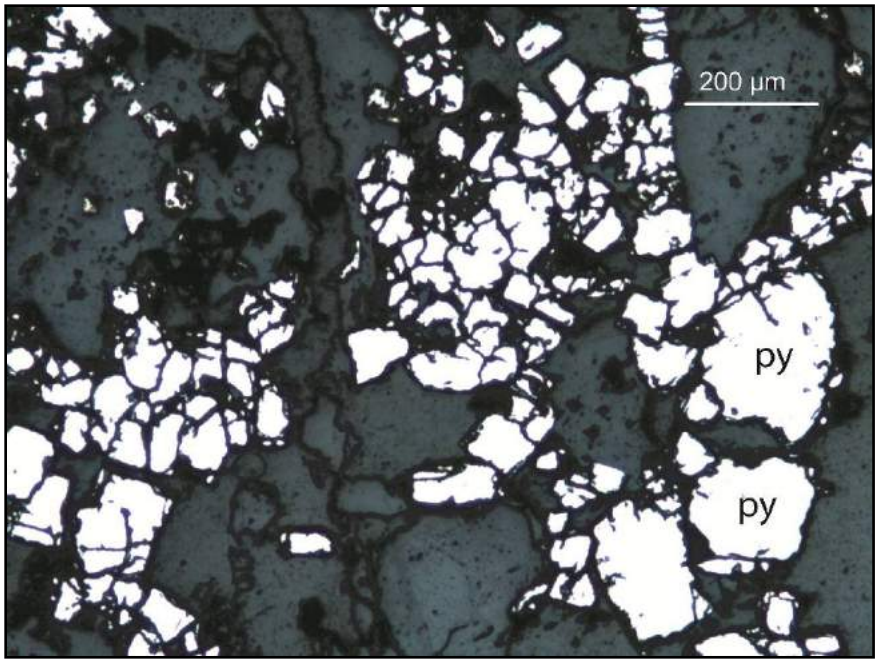


Figure 32 - Hop Hoa-1. Veinlets of pyrite; reflected light, uncrossed polars.

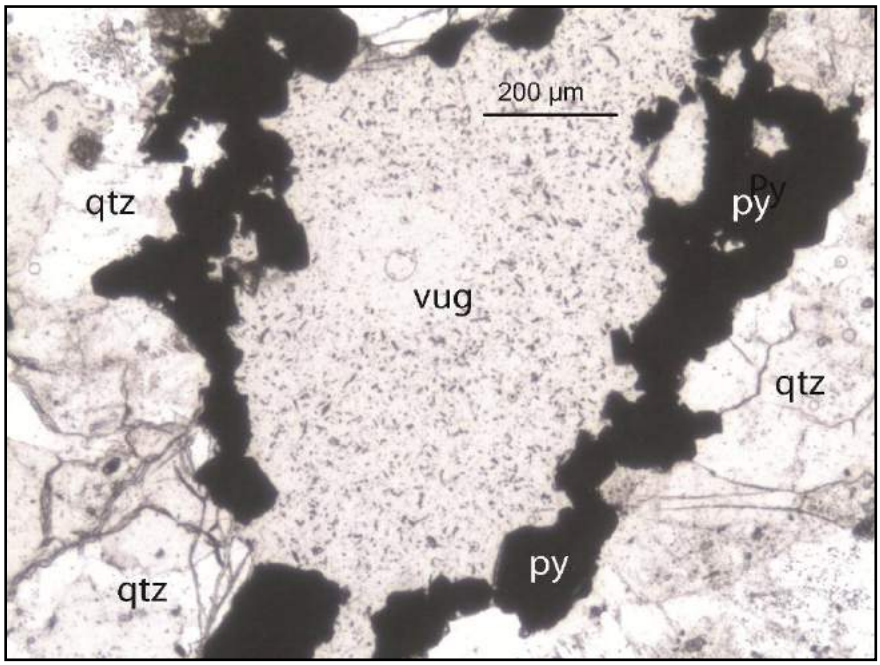


Figure 33 - Hop Hoa-1. Vug lined with pyrite (py) and quartz (qtz); transmitted light, uncrossed polars.

Hop Hoa-2A

Thin Section: 

Consists of a low-grade metamorphic rock with strong foliation that features augen ("eyes") of microcrystalline quartz, or chert, some of which has recrystallized to individual quartz grains. The rock has been strongly oxidized by yellow–brown limonite, resulting in streaks of FeOx (goethite?) and disseminated grains of hematite (Figures 33, 34). Note the veining in this sample in the thin section above

Geochemical Anomalies: 18 Geochemical Index Rank: **2nd**

Al = 9.10% Ce = 245 ppm Cr = 54 Cu = 136.5 ppm Fe = 20.1% Ga = 34.5 ppm Hf = 4.2 ppm
K = 3.39 ppm La = 94.2 ppm Mo = 12.8 ppm Nb = 24.0 ppm Ni = 50.1 ppm P = 2,060 ppm
Rb = 136.0 ppm Sb = 25.4 Th = 13.1 ppm Y = 24.1 ppm Zr = 202 ppm

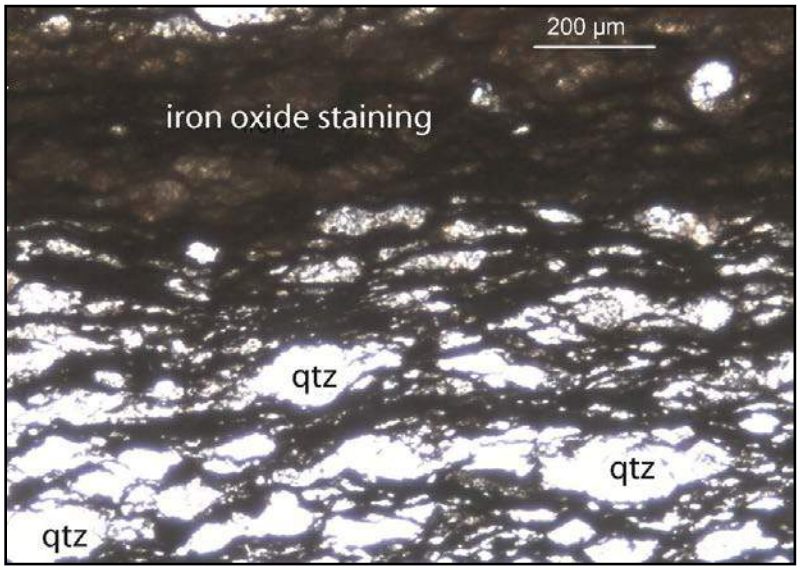


Figure 34 - Hop Hoa-2A. Augen ("eyes") of microcrystlline quartz in strongly foliated, iron-stained, and sheared rock. Transmitted light.

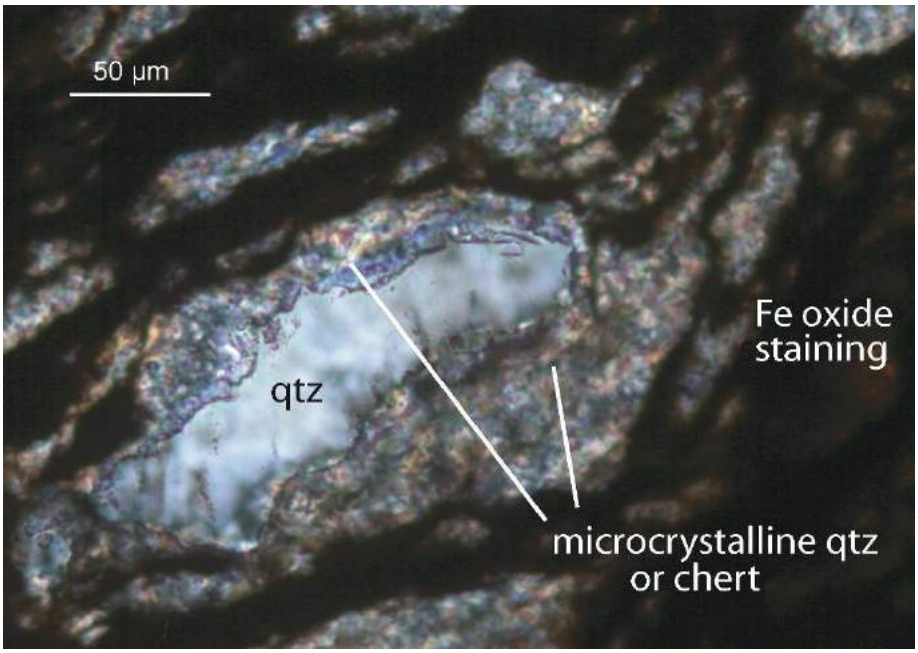


Figure 35 - Hop Hoa-2A. Enlarged view of one augen above, showing recrystallization of microcrystalline quartz or chert inward to a single coarse grain of quartz; transmitted light, crossed polars.

Hop Hoa-2B

Fractured and sheared light brown felsic material in breccia with matrix of quartz and fine grained muscovite (sericite) in small fractures or selvages on lithic fragments; oxidized with abundant iron oxides.

Geochemical Anomalies: 12 Geochemical Index Rank: **5th**

Ba = 280 ppm Ce = 195 ppm Co = 41.6 ppm Cu = 147.0 ppm Fe = 17.3% La = 82.9 ppm
Mn = 991 ppm Mo = 8.80 ppm P = 1,750 ppm Sb = 26.1 ppm Th = 10.8 ppm Zr = 164.5 ppm

Hop Hoa-2C

Geochemical Anomalies: 4 Geochemical Index Rank: **12th**

Cs = 6.59 Ga = 33.1 Sr = 192.5 ppm V = 397 ppm

Hop Hoa-3

Vuggy, amphibole-rich (tremolite?) rock with accessory quartz, and widely disseminated grains of magnetite-hematite, generally less than 20 microns in size (Figures 36-38).

Geochemical Anomalies: 5 Geochemical Index Rank: **11th**

Cd = 1.59 ppm Cs = 4.80 ppm Ga = 28.4 ppm Sr = 1,485 ppm V = 331 ppm

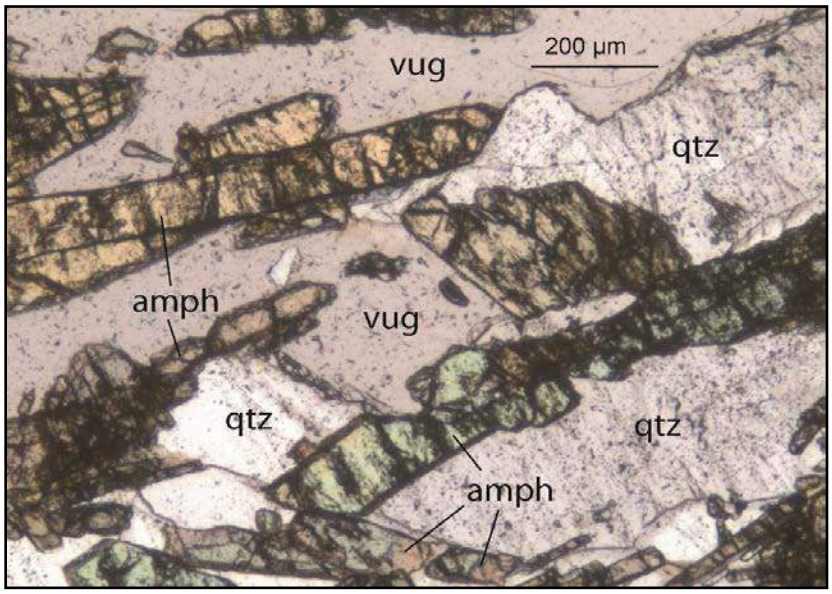


Figure 36 - Hop Hoa-3A. Vuggy, amphibole-rich rock (tremolite?), with accessory quartz; plane-polarized light.

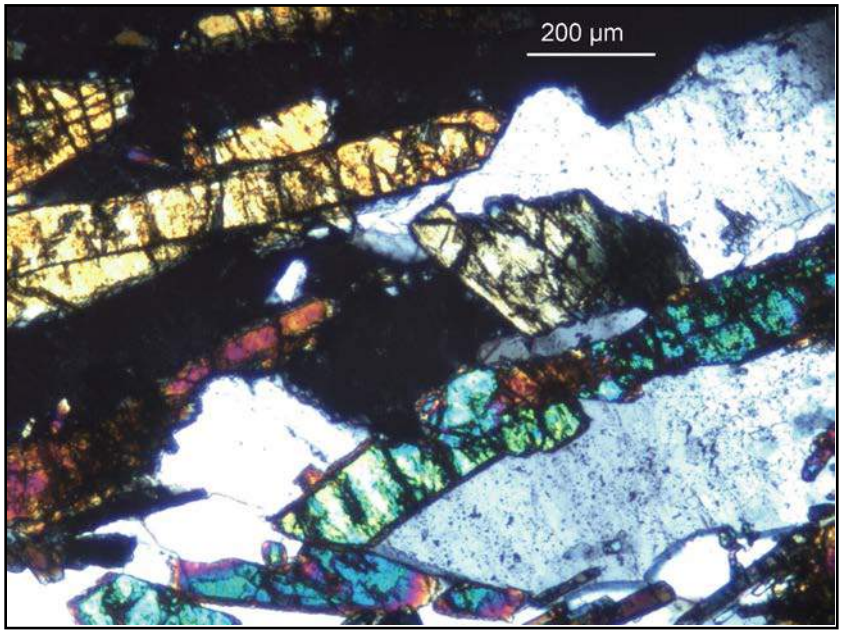


Figure 37 - Hop Hoa-3A. Same as above; crossed polars.

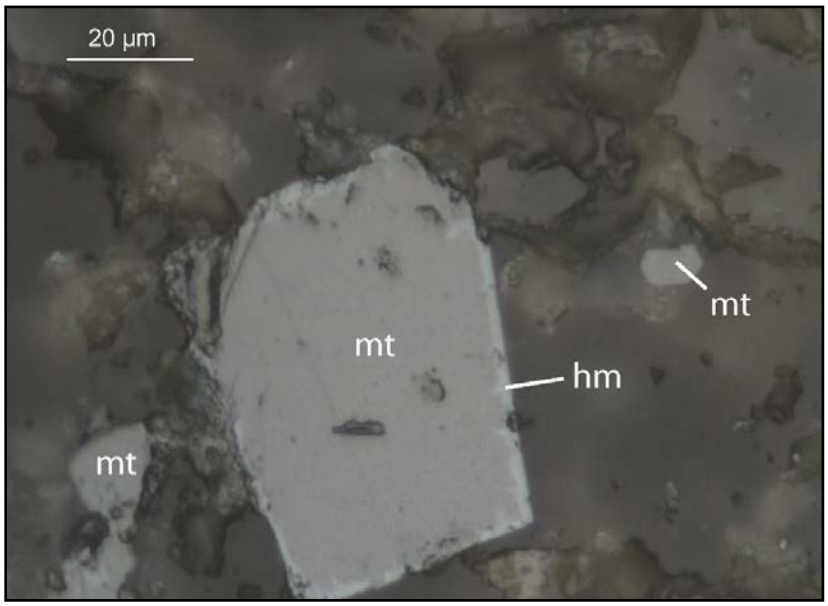
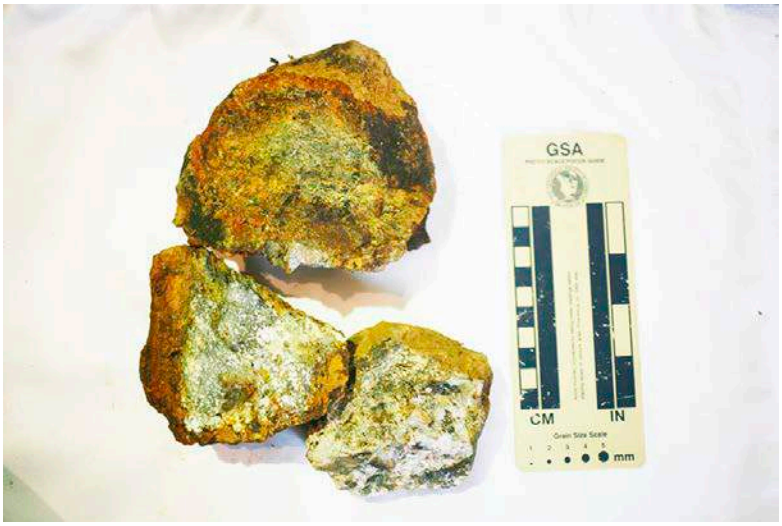


Figure 38 - Hop Hoa-3C. Disseminated grains of magnetite (mt), with rims oxidized to hematite (hm). Reflected light, uncrossed polars.

Hop Hoa-4



Felsic rock with argillized (clay-altered) kspar, and lesser amounts of quartz, shredded biotite, and chlorite. Small inclusions of mafic volcanic rock with randomly oriented plagioclase microlites. Finely disseminated intergrowths of magnetite (mt) and hematite (hm) are also present (Figures 39-41).

Geochemical Anomalies: 16 Geochemical Index Rank: **3rd**

Ce = 62.6 ppm Co = 60.8 Cr = 53 ppm Cu = 141.5 ppm Hf = 3.2 ppm La = 34.9 ppm Mn = 2,480 ppm Nb = 25.9 ppm Ni = 103 ppm Sc = 29.9 ppm Sr = 737 Th = 2.7 ppm V = 313 ppm Y = 29.8 ppm Zn = 172 ppm Zr = 111.5 ppm

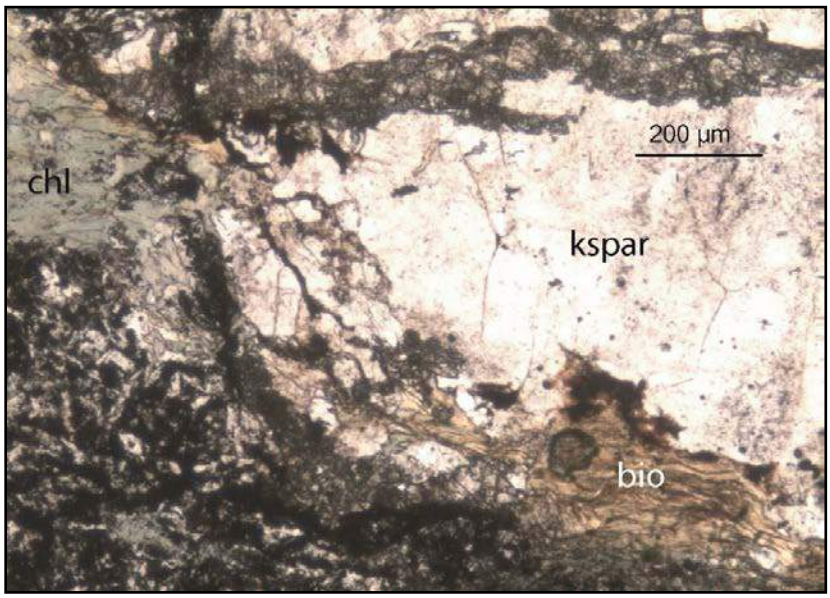


Figure 39 - Hop Hoa-4A. View of argillized kspar, rimmed by chlorite (chl), biotite (bio), and volcanic inclusion, lower left; transmitted light.

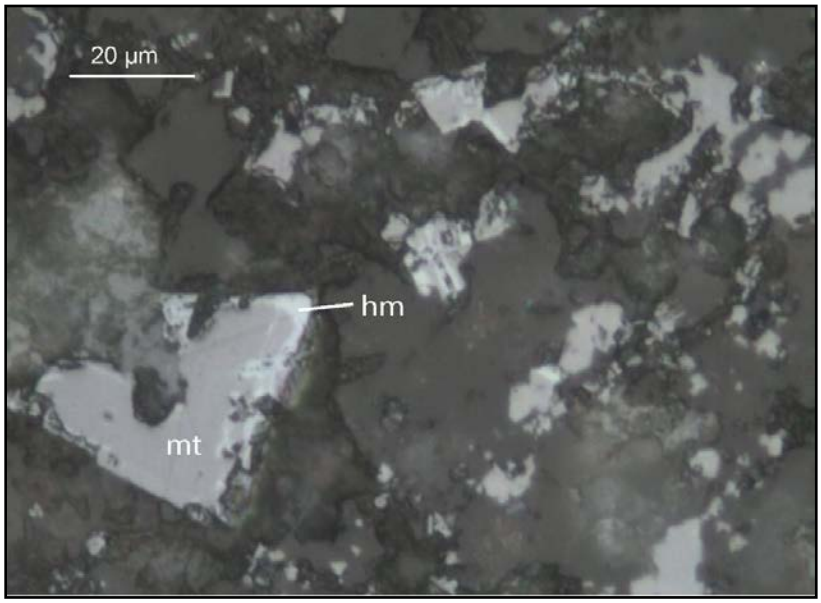


Figure 40 - Hop Hoa-4B. Disseminated grains of magnetite-hematite intergrowths in altered granitic rock; reflected light, uncrossed polars.

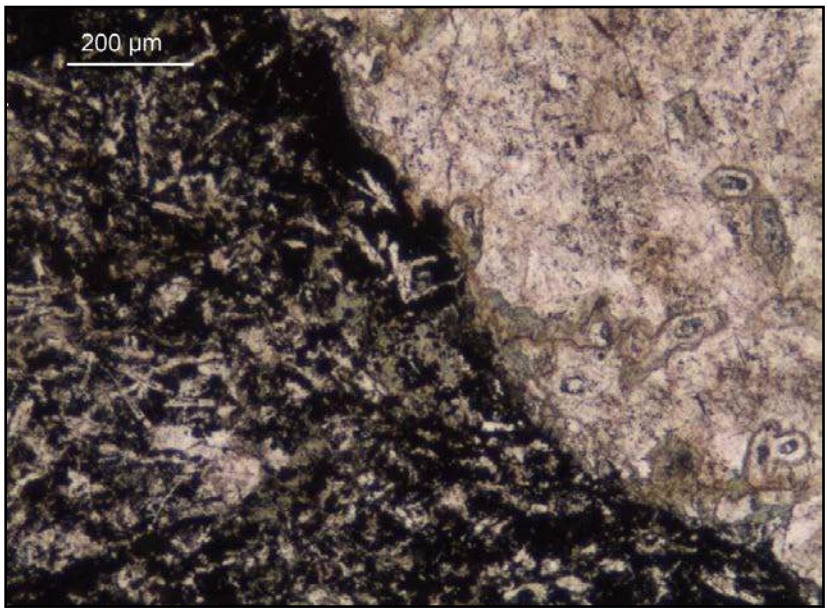
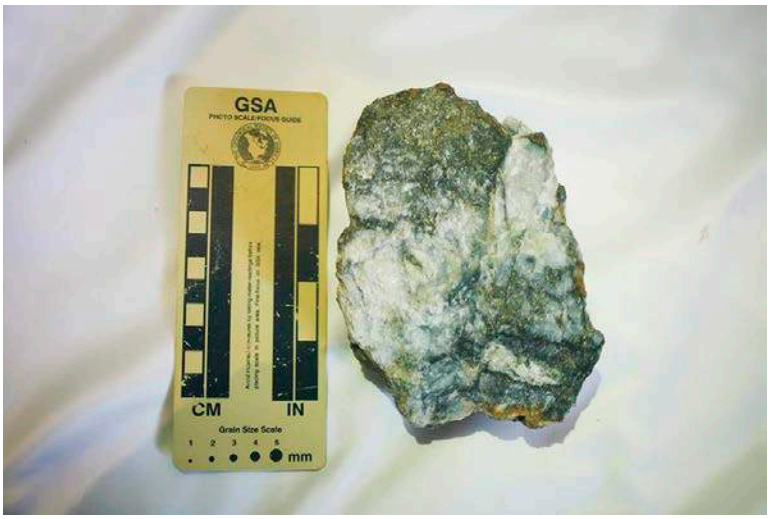


Figure 41 - Hop Hoa-4C. View of volcanic rock inclusion:, left; sericitized alkali feldspar (kspar), right; transmitted light, uncrossed polars.

9.2 Vai Dao Mine Area

Vai Dao-1



The rock is strongly altered to carbonate (calcite?), with quartz-pyrite veining and disseminated grains of chalcopyrite. Pyrite, less than 0.5 mm in diameter, occurs both as disseminations and in veinlets, and is extremely fractured (Figures 42,43).

Geochemical Anomalies: 2 Geochemical Index Rank: **14th**

S = 5.12% Sb = 13.35 ppm

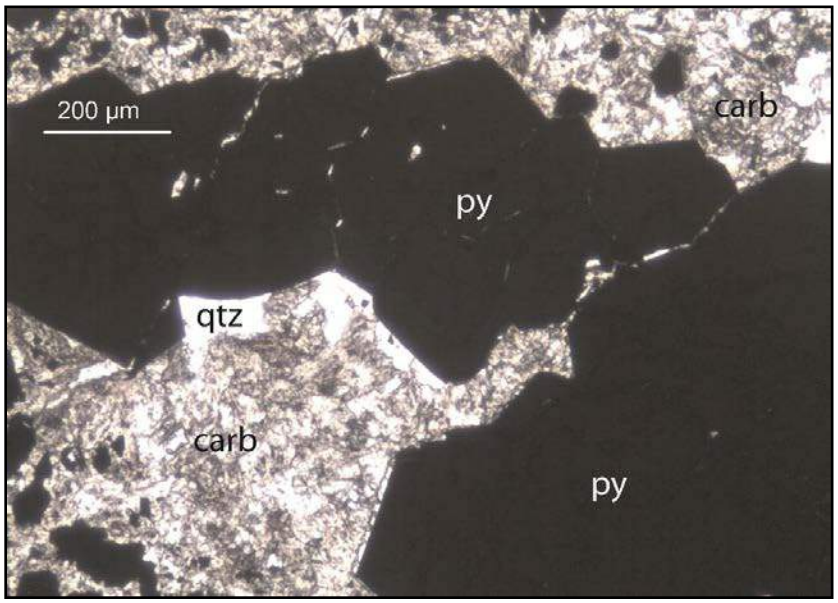


Figure 42 - Vai Doa-1. Pyrite-quartz-carbonate (carb) veinlet: transmitted light, uncrossed polars.

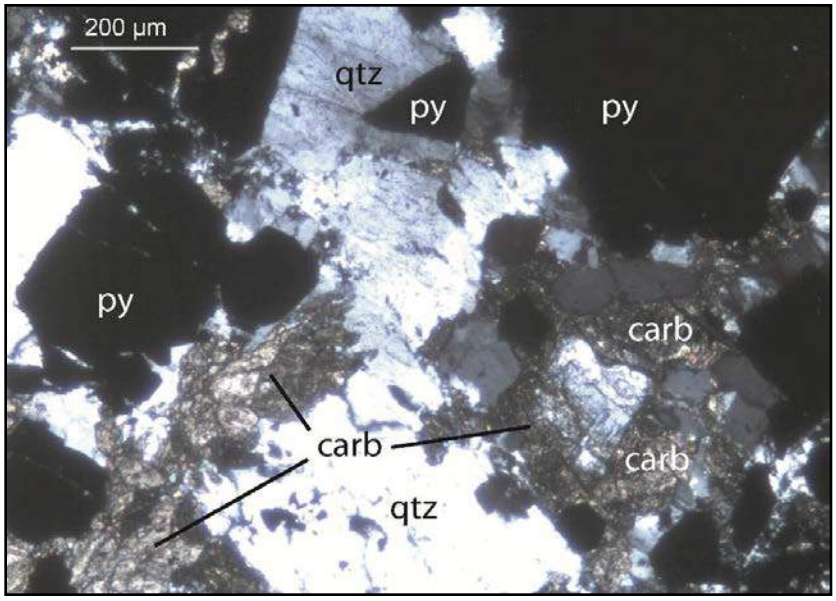


Figure 43 – Vai Dao-1. Vein containing pyrite-quartz-carbonate; transmitted light, crossed polars.

Vai Dao-2

Rock has been silicified producing an interlocking quartz mosaic. Quartz is "dusted" by very fine clay particles. Veins of quartz containing carbonate, pyrite, and very fine-grained mica, hereafter referred to as "sericite", and minor alkali feldspar (kspar). (Much of the carbonate is probably calcite, staining would determine the true variety of carbonate). Pyrite is anhedral to euhedral, and shows nearly right-angle striation patterns. Traces of a light-gray mineral are also present, possibly sphalerite or a copper mineral? (Figure 44).

Geochemical Anomalies: 6 Geochemical Index Rank: **10th**

Au = 8.69 g/t As = 2,430 ppm Cu = 459 ppm Fe = 21.9 % Ni = 127.5 ppm S = > 10%

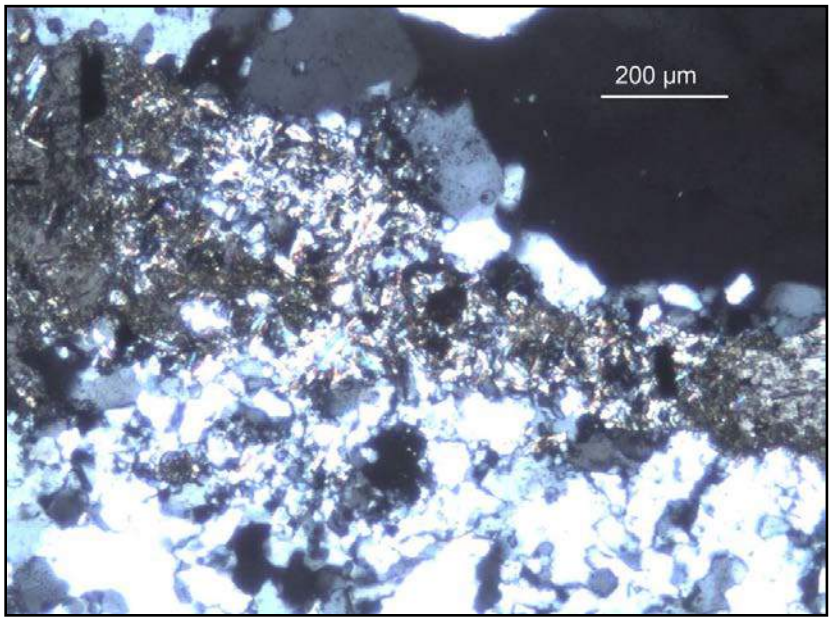


Figure 44 - Vai Dao-2. Quartz-carbonate veinlet with fine mica; transmitted light, crossed polars.

Vai Dao-3

Rock consists of thin quartz-carbonate veinlets containing pyrite and sericite, and unidentified gray finely granular material (copper mineral?). Some of the quartz veinlets also contain disseminated chalcopyrite (Figures 45-46).

Geochemical Anomalies: 8 Geochemical Index Rank: **8th**

Ba = 110 ppm Ca = 3.15% Li = 11.1 ppm Mg =2.04% Mn = 2,420 Rb = 59.1 ppm Sn = 18.8 ppm W = 9.6 ppm

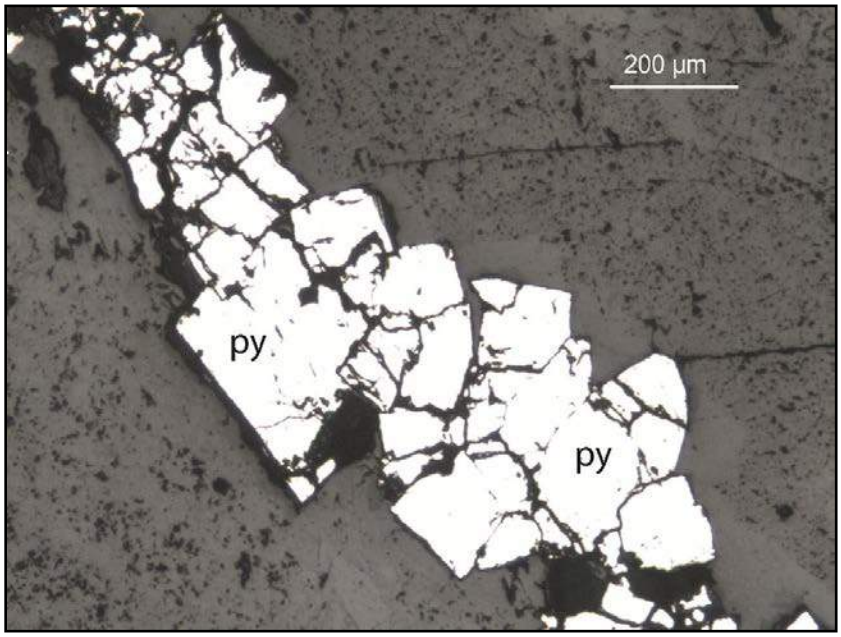


Figure 45 - Vai Dao-3. Pyrite veinlet in quartz (gray) with disseminated fine-grained sericite (a phyllosilicate) : reflected light, uncrossed polars.

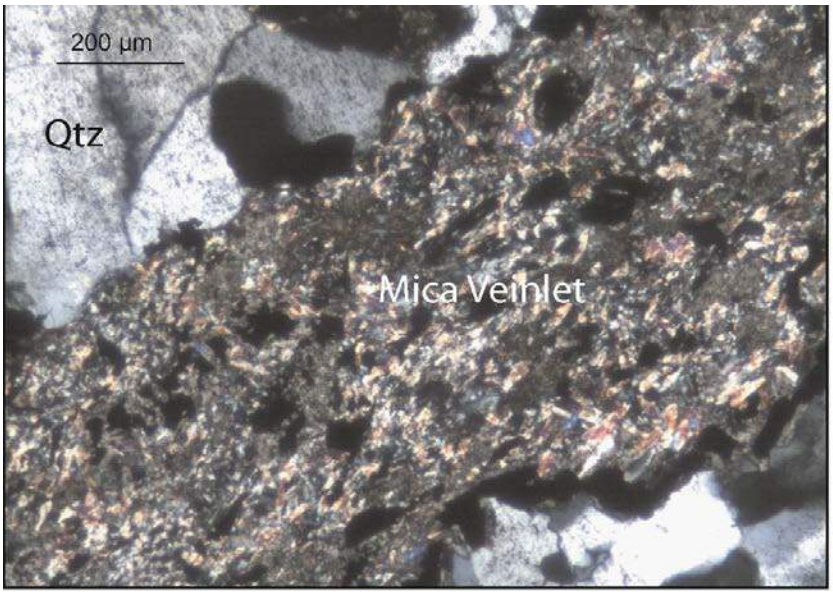
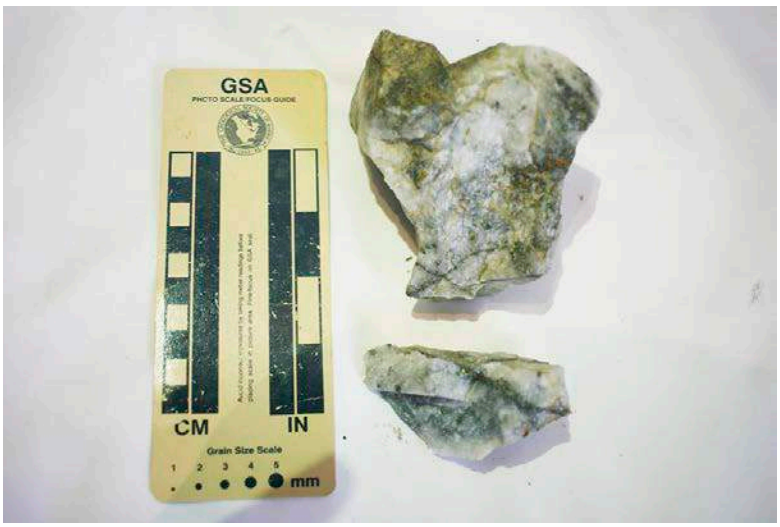


Figure 46 - Vai Dao-3A. Veinlet of fine-grained mica, or "sericite" with embedded pyrite (dark opaque); transmitted light, crossed polars.

Vai Dao-4



Consists of a fine grained grey brecciated and silicified mafic wall-rock fragment adjacent to quartz vein, the latter containing minor pyrite, and a brown opaque mineral resembling sphalerite. Also contains very small grains of a metallic grey mineral (copper?).

Geochemical Anomalies: 5 Geochemical Index Rank: **11th**

Au = 2.96 g/t As = 1025 ppm S = 8.89% Sb = 23.0 ppm Tl = 2.29 ppm

Vai Doa-5A

Rock is silicified producing a quartz mosaic, with narrow pyrite veinlets and fracture fillings. Coarse pyrite is also disseminated throughout the section. Several vugs contain coarse pyrite, sericite, and fine-grained carbonate (Figure 47).

Geochemical Anomalies: 14 Geochemical Index Rank: **4th**

Ba = 300 ppm Ca = 5.93% Ga = 19.6 ppm K = 2.64% Mg = 2.55% Mn = 1870 ppm Nb = 15.7 ppm P = 2270 ppm Rb = 132 ppm Sc = 22.8 ppm Sr = 255 pmm V = 262 ppm W = 2.5 ppm Y = 18.0 ppm

Vai Doa-5B

Geochemical Anomalies: 2 Geochemical Index Rank: **15th**

Au = 1.55 g/t As = 3,260 ppm

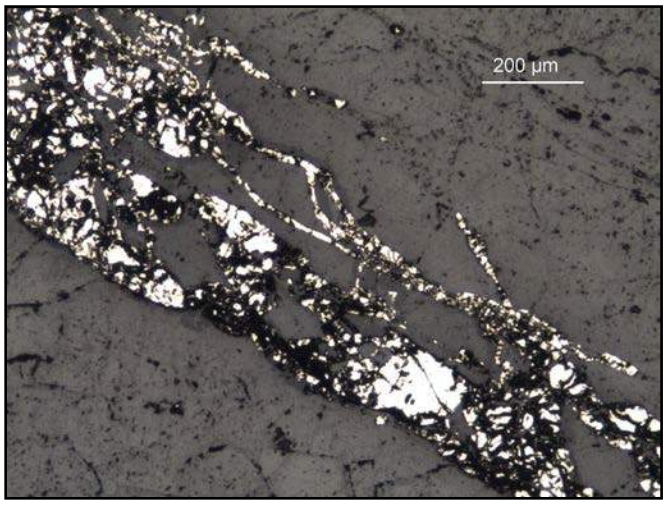


Figure 47 - Vai Dao-5A. Micro-veinlets of pyrite (white) in quartz (gray) with disseminated sericite (black); Reflected light, uncrossed polars.

9.3 Lang Sen Area

Lang Sen 1-1

Dense to vuggy highly oxidized and leached, mostly quartz, breccia. Precursor material was silicified breccia, and degree of oxidation indicates original high sulfide content, mostly pyrite. A few remnant striated euhedral pyrite crystals and rare chalcopyrite occurs, One grain of what appears to be gold is present (circled on hand specimen). Sample may be oxidized equivalent to Hop Hoa-1.

Geochemical Anomalies: 11 Geochemical Index Rank: **6th**

Au = 11.30 g/t Ag = 2.25 ppm As = >1% Ba = 390 ppm Fe = 24.5% P = 1,950 ppm Pb = 63.8 ppm S = 1.86% Sb = 201 ppm Te = 5.70 ppm V = 210 ppm

Lang Sen-1-2A

Very vuggy, leached pyrite-rich rock that contains a network of pyrite veinlets. Patches of very coarse-grained pyrite are also present (Figure 48).

Geochemical Anomalies: 7 Geochemical Index Rank: **9th**

Co = 109 ppm Fe = 37.8% Ni = 169 ppm Pb = 293 ppm S = > 10% Se =18 ppm
Tl = 15.2 ppm

Lang Sen-1-2A-2

Geochemical Anomalies: 0 Geochemical Index Rank: **16th**

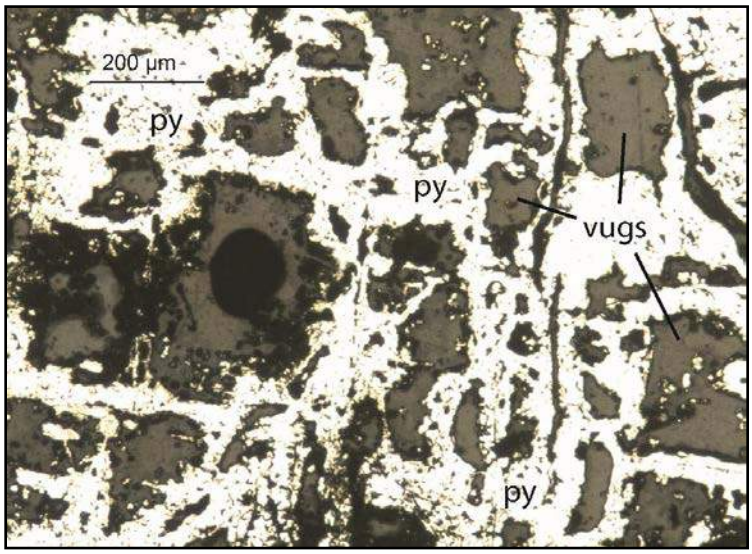


Figure 48 - Lang Sen-1-2A. Leached, porous rock with veinlet network of pyrite; reflected light, uncrossed polars.

Lang Sen-1-2B-1

Silicified rock with veinlets of pyrite, some with coliform borders (indicative of supersaturated fluids and rapid crystal growth) (Figure 49).

Geochemical Anomalies: 4 Geochemical Index Rank: **12th**

As = 3,140 ppm Cu = 519 ppm Fe = 18.65% S = >10%

Lang Sen 1-2B-2:

Red to brown highly oxidized vuggy silicified quartz breccia, and clay altered wall rock fragments. Minor remnant pyrite occurs where encapsulated in quartz in breccia matrix. Iron oxide after pyrite occurs as box works.

Geochemical Anomalies: 3 Geochemical Index Rank: **13th**

Au = 3.33 g/t Ag = 6.70 ppm Fe = 10.05%

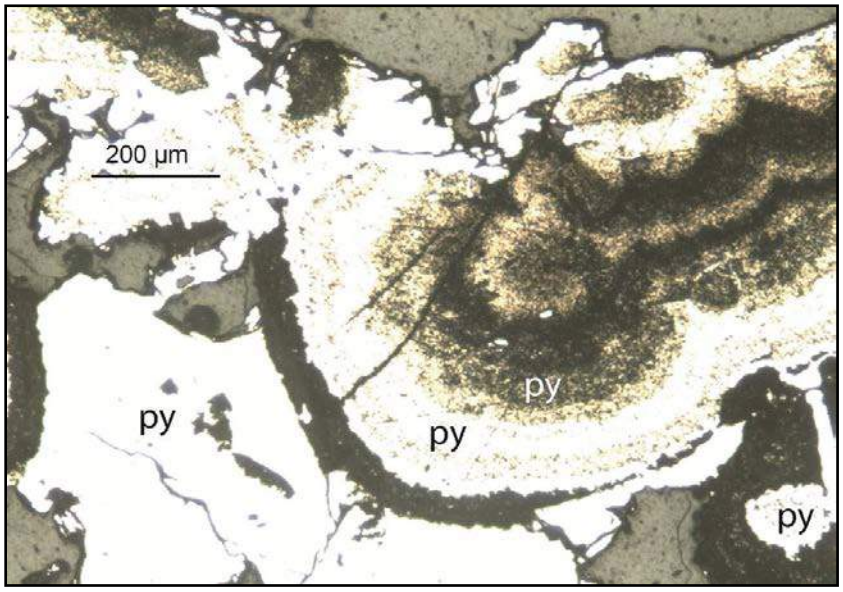


Figure 49 - Lang Sen-1-2B. Pyrite with both crystalline and colloform texture.

Lang Sen-1-2C

Rock contains two separate mineral assemblages, one dominated by pyrite veinlets, the other characterized by chalcopyrite, $CuFeS_2$, replaced by covellite, CuS (Figure 50, 51).

Geochemical Anomalies: 1 Geochemical Index Rank: **14th**

Au = 1.27 g/t

Lang Sen-1-2C-2

Geochemical Anomalies: 2 Geochemical Index Rank: **13th**

Au = 1.11 g/t S = >10%

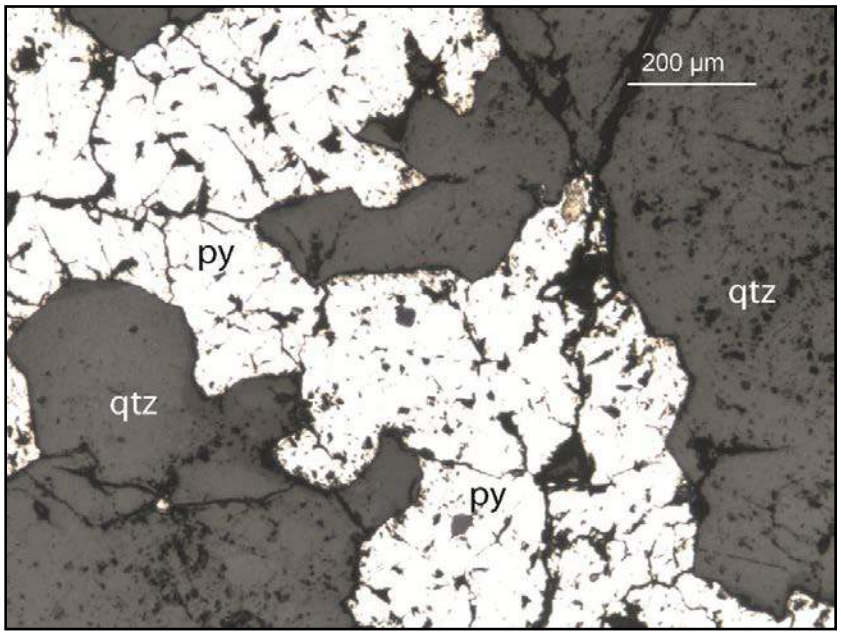


Figure 50 - Lang Sen-1-2C. Pyrite vein in quartz; small yellow mineral in pyrite unknown (?chalcopyrite); reflected light, uncrossed polars.

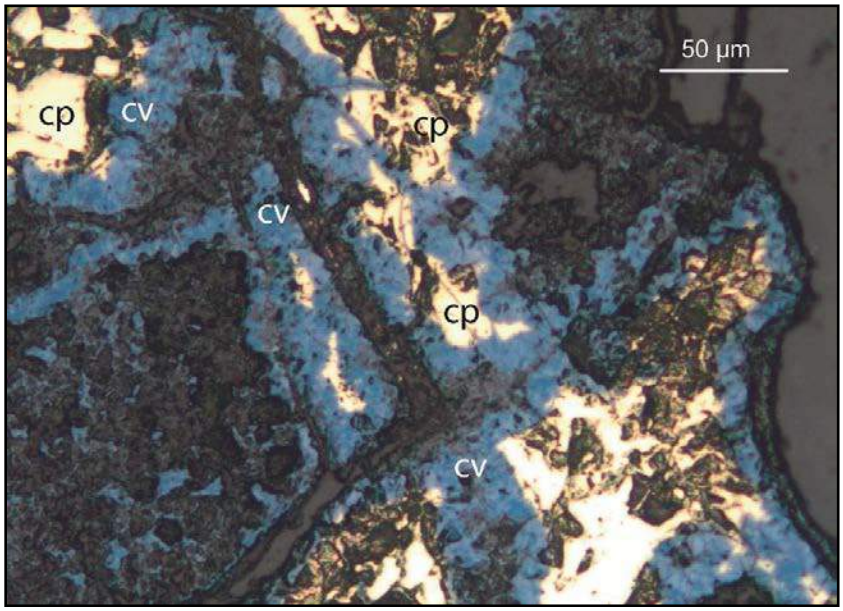


Figure 51- Lang Sen-1-2C. Stockwork veining of chalcopyrite (cp) replaced by covellite (cv) in a matrix of brecciated quartz fragments of later stage of quartz veins after the cp; reflected light, uncrossed polars.

Lang Sen 2-3A:

Massive white quartz vein in highly oxidized selvage of greenish to white altered vuggy material. Box works of fine silica containing small grains of unknown metallic mineral.

Geochemical Anomalies: 3 Geochemical Index Rank: **12th**

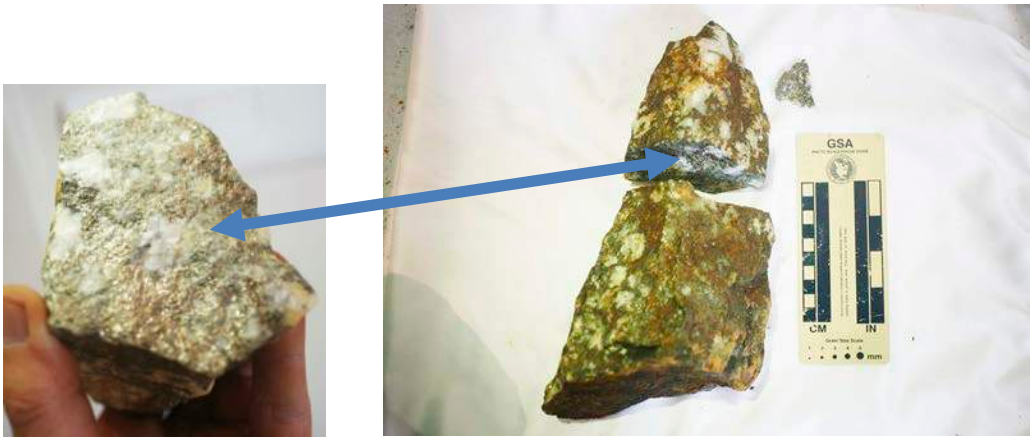
As = > 1% Sb = 281 ppm Zn = 171 ppm

Lang Sen 2-3B

Geochemical Anomalies: 9 Geochemical Index Rank: **7th**

Au = 4.95 g/t Ag = 1.55 ppm As = >1% Cu = 388 ppm Pb = 86.1 ppm S = 7.25% Sb = 515 ppm Se = 11 ppm Te = 3.00 ppm

Lang Sen-2-3B-1



Consists of silicified and vuggy material consisting of veinlets of pyrite and carbonate. Local minor grains of chalcopyrite and pyrrhotite, up to 0.6mm, occur (Figures 52-57).

Geochemical Anomalies: 3 Geochemical Index Rank: **13th**

Cu = 647 ppm Fe = 36.9% S = > 10%

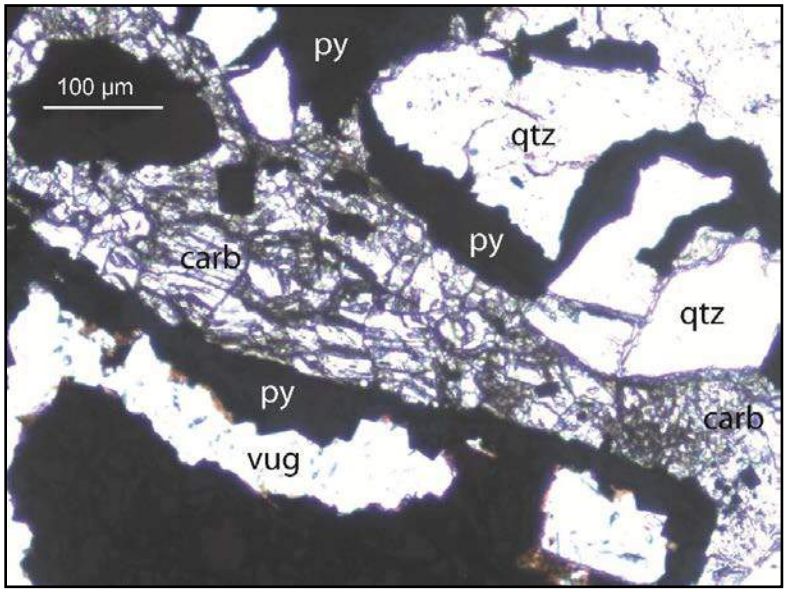


Figure 52 - Lang Sen-2-3B-1. Carbonate veinlet (carb), with quartz and pyrite; transmitted light, uncrossed polars.

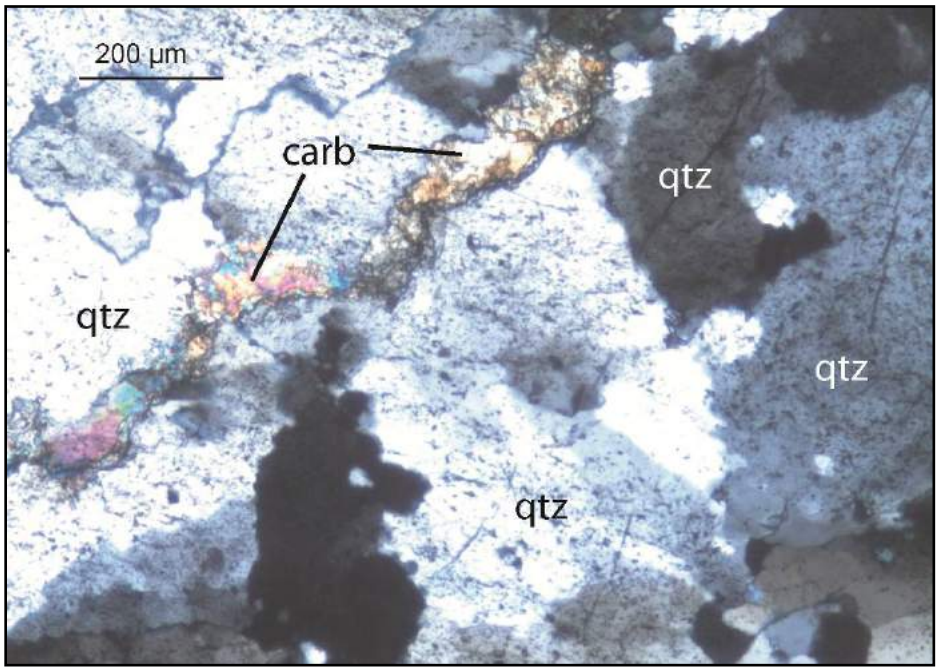


Figure 53 - Lang Sen-2-3B-1. Silicified material cross-cut by carbonate veinlet; black mineral also quartz (at angle of extinction); scattered, with very small grains of sericite in quartz; transmitted light, crossed polars.

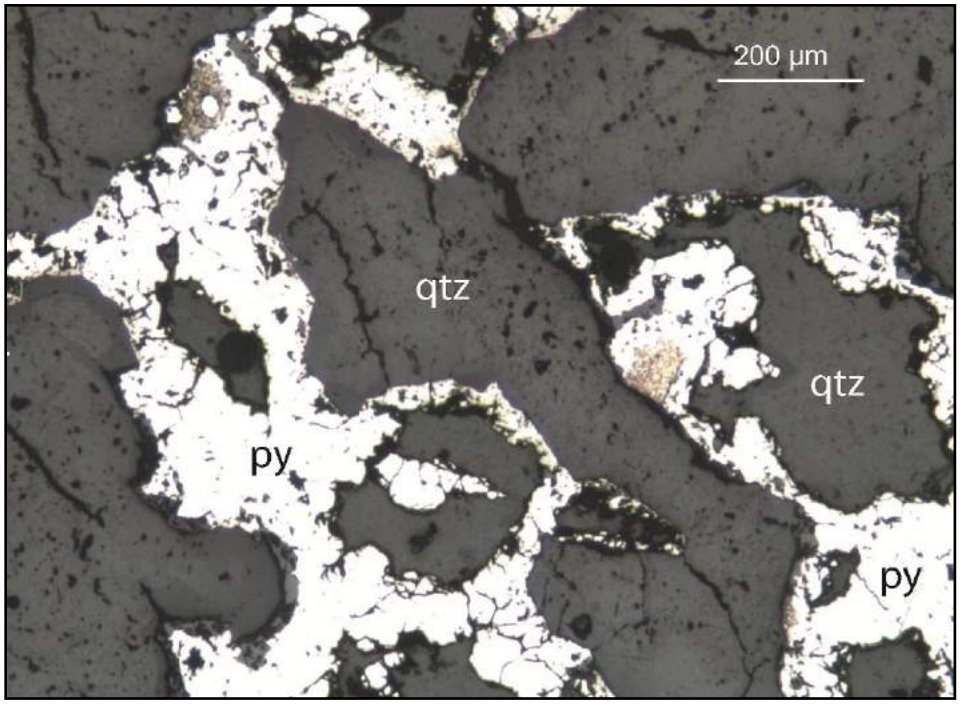


Figure 54 - Lang Sen-2-3B-1. Irregular quartz-pyrite veining in quartz; the yellow mineral is chalcopyrite showing intial oxidation to iron oxide during weathering; reflected light, uncrossed polars.

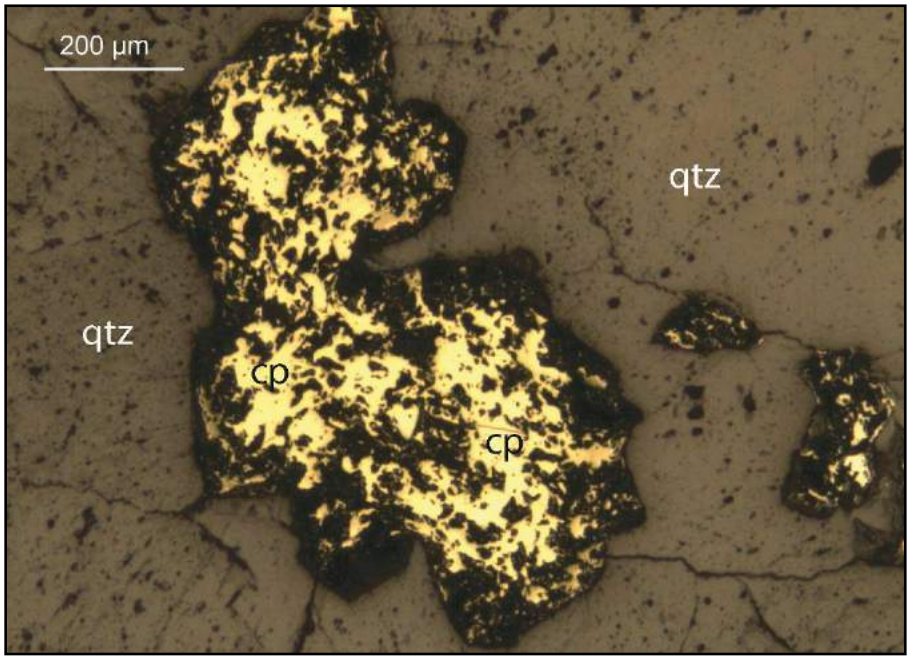


Figure 55 - Lang Sen-2-3B-1. Disseminated chalcopyrite (cp) in quartz; reflected light, uncrossed polars.

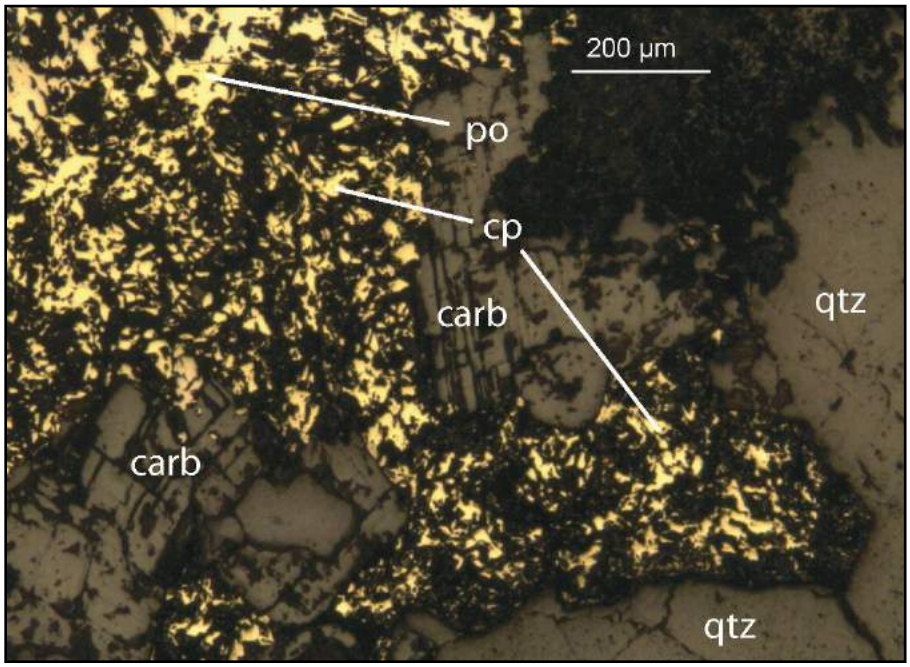


Figure 56 - Lang Sen-2-3B-1. Intergrown chalcopyrite, pyrrhotite, and carbonate; reflected light, uncrossed polars.

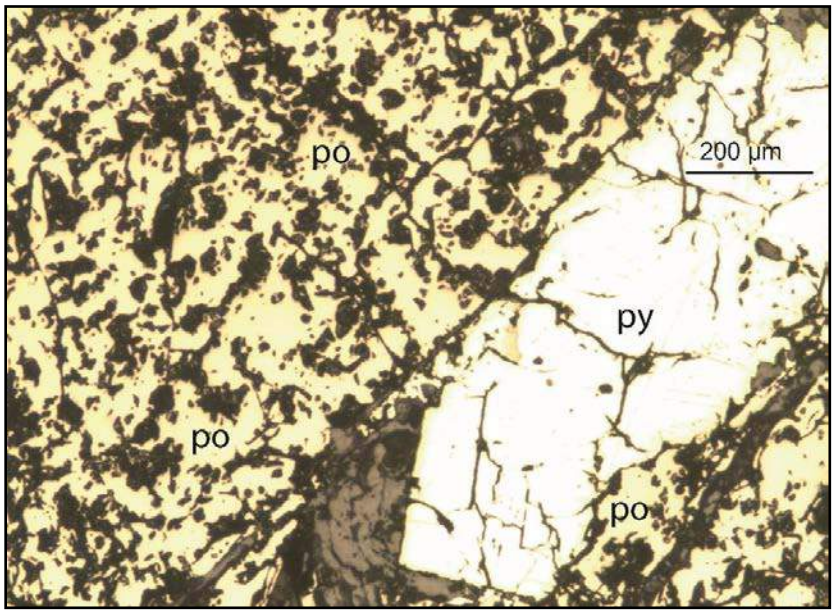


Figure 57 - Lang Sen-2-3B-1 Pyrite (py) grain enclosed by pyrrhotite (po); gray mineral is likely quartz; reflected light, uncrossed polars.

Lang Sen 2-3B-2

Red to brown partially oxidized quartz breccia containing fresh to partially oxidized massive coarse crystalline pyrite. Multiple generations of pyrite coarse to fine, occur where the latter more readily oxidizes to iron oxides.

Geochemical Anomalies: 19 Geochemical Index Rank: **1st**

Ba = 700 ppm Be = 5.38 ppm Ce = 81.5 ppm Cr = 53 ppm Cu = 171 ppm Fe = 16.85%
Ga = 41.3 ppm K = 3.31% La = 34.9 ppm Li = 24.1 ppm Mo = 3.42 ppm Nb = 10.8 ppm P = 2,500 ppm Rb = 148 ppm Sc = 34.6 ppm Sn = 15.9 ppm V = 387 ppm W = 6.5 ppm Y = 23.6 ppm

Lang Sen 2-3B-3

Geochemical Anomalies: 2 Geochemical Index Rank: **15th**

As = 743 ppm S = 3.51%

Lang Sen 2-3B-4

Fractured and sheared quartz and partially oxidized coarse pyrite.

Geochemical Anomalies: 6 Geochemical Index Rank: **10th**

Au = 5.19 g/t Ag = 2.42 ppm Cu = 946 ppm Fe = 22.7% Mo = 8.41 ppm S = >10%

Lang Sen 2-3B-5

Geochemical Anomalies: 1 Geochemical Index Rank: **15th**

As = 2,850 ppm

Lang Sen-3-4A

Siliceous rock containing sericitized kspar and veinlets of chlorite (Figures 58,59).

Geochemical Anomalies: 16 Geochemical Index Rank: **3rd**

Au = 5.48 g/t Ag = 18.60 ppm Co = 116 ppm Cr = 56 ppm Cu = 2,370 ppm Fe = 21.9%
Ga = 18.95 ppm Li = 27.3 ppm Mg = 1.05% P = 1,760 ppm S = 2.71% Sc = 23.1 ppm
V = 278 ppm Y = 21.3 Zn = 1,120 ppm Zr = 41.4 ppm

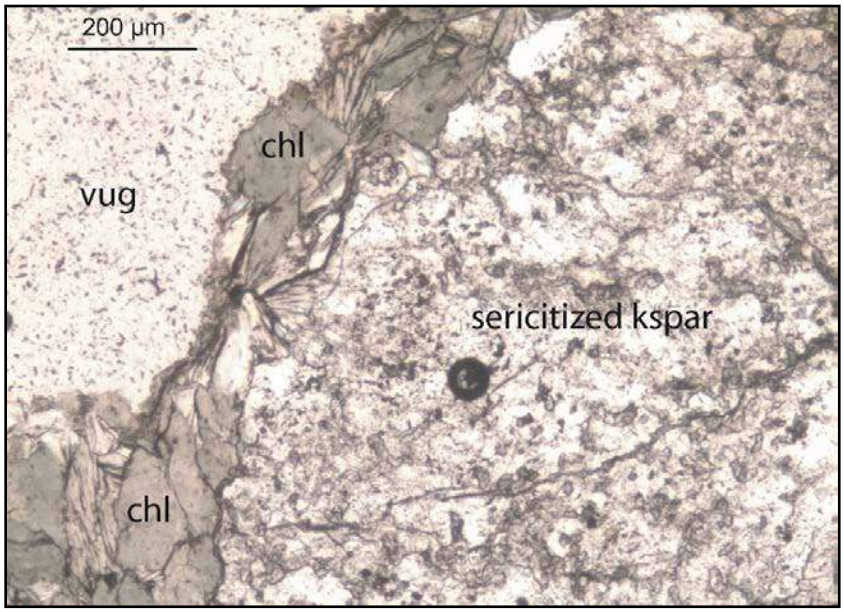


Figure 58 - Lang Sen-3-4A. Sericitized kspar with chloritized rims; Transmitted light, uncrossed polars.

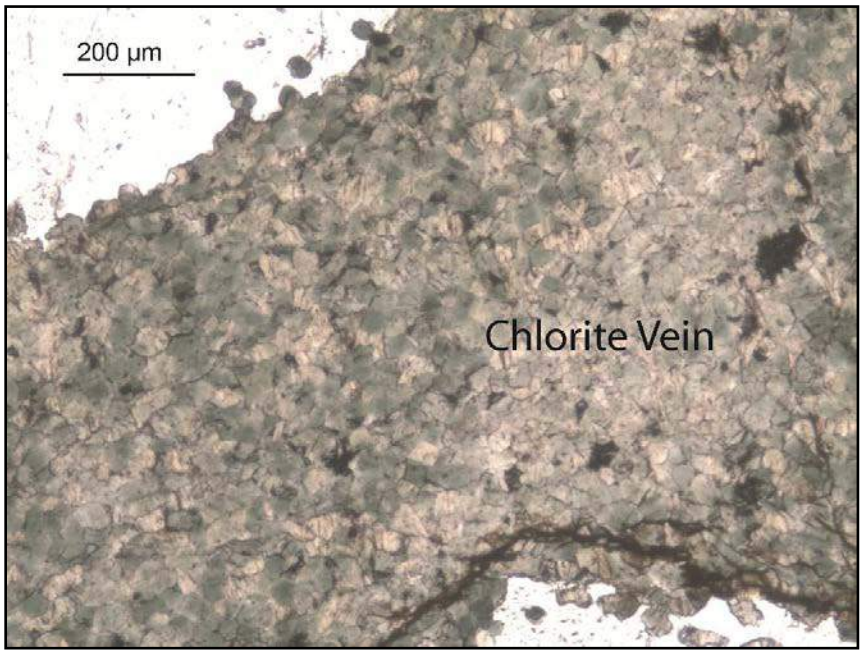


Figure 59 - LangSen-3-4A. Chlorite vein; transmitted light, uncrossed polars.

Lang Sen 3-4B

Oxidized massive and fractured quartz, locally showing vugs. Small spherical black concentric (1 mm) masses, and coalescing spheres of the latter locally occur in the quartz. The latter also contains fine-grained hematitic material.

Geochemical Anomalies: 1 Geochemical Index Rank: **15th**

Zn = 313 ppm

Lang Sen 3-4C

Geochemical Anomalies: 15 Geochemical Index Rank: **4th**

Al = 9.66% Ce = 89.3 ppm Fe = 14.3 % Ga = 33.6 ppm La = 49.4 ppm Li = 66.7 ppm
Mn = 2,480 ppm Nb = 29.3 ppm Ni = 119.5 ppm P = 1,660 ppm Sc = 36.2 ppm V = 453 ppm
Y = 66.4 ppm Zn = 350 ppm Zr = 57.4 ppm

Lang Sen 3-4D

Geochemical Anomalies: 3 Geochemical Index Rank: **13th**

Ag = 11.35 ppm Fe = 2.4% Zn = 163 ppm

9.4 Lien Son Area

Lien Son 2-2

Geochemical Anomalies: 6 Geochemical Index Rank: **10th**

Au = 68.9 g/t Cr = 87 ppm Fe = 4.48% Sr = 165 ppm Th = 5.3 ppm Zr = 70.7 ppm

Section 10.0 Geochemical Index

The Geochemical Index Rank has been established for each of the 38 samples analyzed for common and trace elements, (i.e., 32 rock samples and 6 tailings samples). Those samples exhibiting the highest rank represent the relative level of mineralization experienced by the sample defined by the number of elemental anomalies. Those samples with the highest number of anomalies within the specific sample population are considered to be more highly mineralized than those with fewer anomalies. Both areas of principal interest (i.e., Hop Hoa and Vai Dao) are clearly mineralized to a significant extent, while Lang Sen ranks even higher.

Table 3

Geochemical Index Ranking

Sample #	Tie	# Anomalies	GI Rank
Lang Sen-2-3B-2		19	1
Hop Hoa-2A		18	2
Hop Hoa-4	Lang Sen-3-4A	16	3
Lang Sen-3-4C		15	4
Vai Dao-5A		14	5
Hop Hoa-2B		12	6
Lang Sen-1-1		11	7

Section 11.0 Mineralization Models

Based on the samples obtained and on a review of the information available, two principal types of mineralization are likely present in the Cao Ram area. These will include either epithermal and/or intrusion-related styles of mineralization. Figure 60 captures the variations to these models of mineralization by illustrating the extent of known gold occurrences.

11.1 Current Concepts

During the past 15 years, there has been renewed emphasis on the diversity in deposit types within provinces containing orogenic gold deposits (e.g., Robert, *et al.*, 1997 and 2007), with emphasis on intrusion-related gold deposits. Sillitoe (1991) grouped these deposits into five distinct classes:

> **Class 1:** Stockworks and disseminated ores in porphyritic and nonporphyritic intrusions; (e.g., representative deposits: Lepanto, OK Tedi, Boddington as examples of the former and the Zortman-Landusky, Salave, Gilt Edge, Kori Kollo deposits as representatives of the latter type of intrusion);

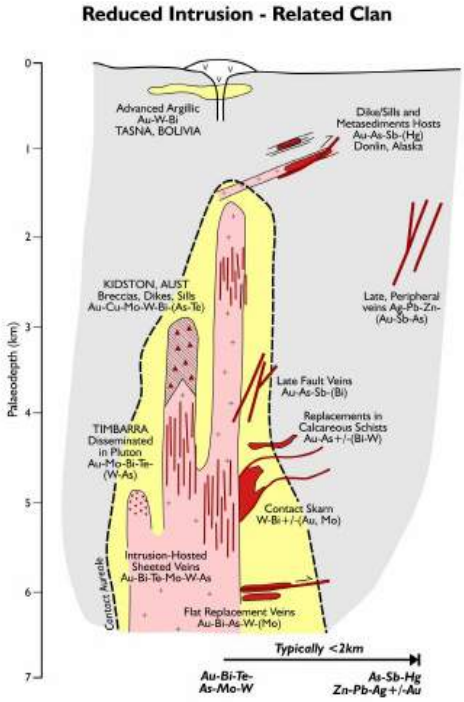


Figure 60 – Modeling of Intrusion-Related Mineralization
(Robert, *et al*., 2007)

Class 2: Skarns and replacement ores; (e.g., Fortitude, McCoy, Nickel Plate, Red Dome as skarn deposits and Barney's Canyon, Ketza River, Yanicocha deposits in carbonate rocks as replacement ores);

Class 3: Stockworks, disseminated ores, and replacement bodies in country rocks as intrusions (e.g., Porgera, Muruntau, Mount Morgan, Quesnel River deposits);

Class 4: Breccia pipes in country rocks (e.g., Montana Tunnels-Golden Sunlight, Kidston, and Chadbourne deposits, and Mount Wright and the Welcome Deposits, NE Qld.); and

Class 5: Mesothermal and low-sulfide, epithermal veins in intrusions and country rocks (e.g., Charters Towers, Jiaodong Peninsula, Majara**,** and Ravenswood and Christian Kruck Deposits, NE Qld.).

The classes obviously reflect many different types of gold deposits that indicate a relatively local zonation within and surrounding a contributing pluton. With some exceptions (e.g., Charters Towers being one exception), there is little debate that most of these gold deposits are genetically associated with a well-defined igneous body and are, therefore, properly classified as intrusion-related deposits (Sillitoe and Thompson, 1998).

However, Class 5 of intrusion-related gold vein deposits may have many characteristics identical to orogenic gold deposits. Of the five geochemical associations that they identify within this class of vein-type deposits, only the deposits with the gold-tellurium-lead-zinc-copper and gold-arsenic-bismuth-antimony associations have features resembling, and can be confused with, orogenic gold deposits.

The mineralization within the area of interest consists of both quartz-dominated and sulfide mineralization. The geochemical values of the samples show associations of a) gold with tellurium-lead-zinc-copper and b) gold with arsenic-bismuth-antimony, suggesting that no such distinctions can be made in this area since both structural conditions and an intrusion-related source of mineralizing fluids at depth are apparent. Furthermore, geochemical cross plots of gold v. arsenic and gold v. sulfur illustrate such intermixing of geothermal mineralizing fluids in the area (see Figures 61 and 62).

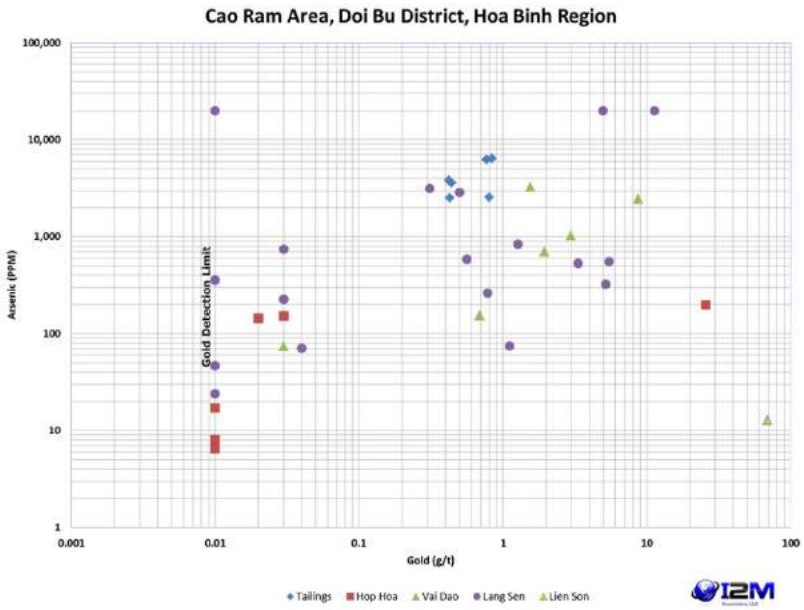
Even by adding a geochemical data set from the Ba Dinh area some 8 kms to the east of Hop Hoa to the plots, it is apparent the intermixing is not locally distributed but is present over a wide area of the domal structure shown in Figures 7A and 7B. Lead distribution may be increasing eastward although this may indicate a local enrichment within a particular feeder system.

Plots that include the Ba Dinh data set with samples designated VD and XV are available by clicking on the link (here) in the figures below. These plots strongly suggest that gold mineralization and the associated geochemistry are similar and widespread in the area of interest. Arsenic has been found in high concentrations and likely occurs within arsenian pyrite, the latter typically occurring in the gold stage of multistage pyrite mineralization. The plot of arsenic versus gold values of the available samples in Figure 61 exhibits a positive correlation, although the r^2 values is low, reflecting low sample count and significant scatter among the data. No arsenopyrite was detected in the petrographic study of the samples. Arsenopyrite has distinctive optical properties, euhedral habit as resistant “coffin”-shaped crystals, high reflectivity, and anisotropism, and should have been detected easily during the thin-section study, if present.

Romberger (1986) reported that arsenic shows a geochemical affinity for gold in a wide range of hydrothermal deposit types from high temperature shear zone-related deposits in orogenic belts (Val ‘dor, Quebec, Homestake, South Dakota), sedimentary rock-hosted deposits (Carlin Trend, Nevada), epithermal deposits (many), to active auriferous geothermal areas (Taupo Zone, New Zealand). Furthermore, Grigoryeva and Sukneva (1981) showed a significant increase in gold solubility in solutions containing dissolved arsenic. When ore minerals oxidize the arsenic typically becomes adsorbed to various secondary oxides. This is supported by the elevated concentrations of arsenic in the tailings. Arsenic in rock samples has been used as an indicator element in gold exploration because its distribution exhibits a wider dispersion zone than gold. The highest grade epithermal gold deposit in Nevada was found by follow-up work on an arsenic anomaly.

Most of the samples also exhibit relatively elevated sulfur levels and indicate sulfide mineralization is widespread in the area of interest as indicated by the presence of pyrite,

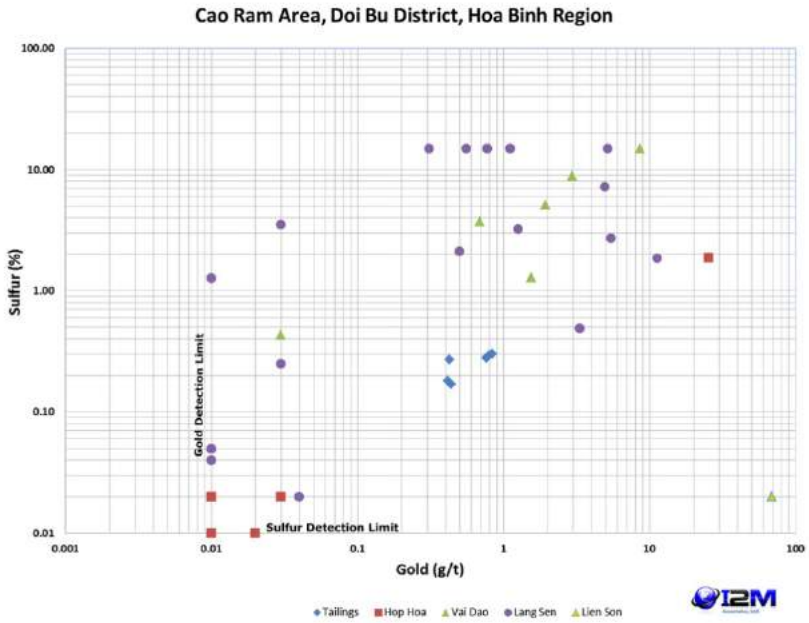
chalcopyrite and pyrrotite. The relationship with gold also confirms such mineralization (see Figure 62).



Click on Figure to Enlarge

Figure 61 – Cross Plot of Gold Values versus Arsenic Values

Plot to Add Arsenic Data from Ba Dinh Project (here)



Click on Figure to Enlarge

Figure 62 – Cross Plot of Gold Values versus Sulfur Values

Plot to Add Sulfur Data from Ba Dinh Project (here)

11.2 Characteristics of Intrusion-Related Deposits

In perhaps the clearest refinement of their defining characteristics, Lang *et al*. (2000), utilizing the studies of Sillitoe (1991) and others, have summarized the major characteristics of intrusion-related gold deposits, illustrated in Figures 60 and 63.

According to Sillitoe, intrusion-related gold mineralization has the following characteristics:

1) Metaluminous, subalkalic intrusions of intermediate to felsic composition that spans the boundary between ilmenite and magnetite series;

2) CO_2-bearing hydrothermal fluids;

3) A metal assemblage that variably includes gold with anomalous bismuth, tungsten, arsenic, molybdenum, tellurium, and/or antimony, and typically carries non-economic base-metal concentrations;

4) Comparatively restricted zones of hydrothermal alteration within granitoids; and

5) A continental tectonic setting well inboard of inferred or recognized convergent plate boundaries, although the area was still part of Pangea, the Song Da Structure could have been part of the break-up.

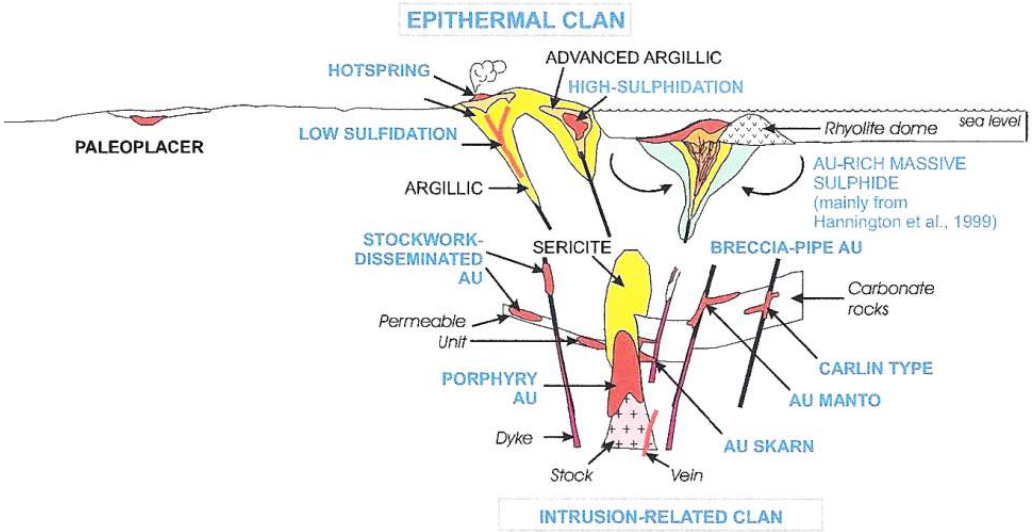


Figure 63 – Epithermal and Intrusion-Related Mineralization (Robert, et al., 2007)

Section 12.0 Geologic Risks

In assessing a project's geological risks in terms of whether there may be sufficient ore grade and tonnage to make a mine, it is important to emphasize that most if not all major centers of gold mineralization in the world have been mined down the trend dip for more than 900 meters. Drilling has intersected mineralization grading over 20 g/t gold at depths of over 1,200 meters in some mines in Australia, for one example. Exploring for deep zones is cash-intensive and of high risk (see Morrison, *et al.*, 2004), but the rewards can be profitable, as confirmed by the number of companies that are currently active in gold mining regions around the world.

12.1 Uniqueness of Gold Deposits

Each significant gold deposit has its own intrinsic value to the mining companies developing the project, to the surrounding inhabitants in terms of potential jobs and potential environmental issues, and to the local and national governments who stand to receive considerable royalties, but they also are charged with regulating the mining industry to protect human health and the environment. The price of gold, of course, has a significant impact on when or if a particular deposit will be mined.

The principal objective of most mine managers is to reduce the cost to produce each ounce of gold as much as reasonably possible. Any decreases in the run-of-mine ore grade have dramatic impacts on the economic viability of any gold mining projects. Insufficient drilling in the early stages of a project has been the cause for shutting down many mines after only a few years. The quality of the initial assessment and production drilling of reserves must be maintained by insuring that the mineable reserves have been measured and proven by drilling and coring beyond a reasonable doubt.

12.2 Project Risk Assessment

The degree of geological risk involved in any particular project depends to a large extent on the caliber of the professional and supporting personnel that are available to guide exploration in determining the gold reserves and resources. In muti-metal deposits, this responsibility becomes even larger.

Because the areas southeast of Cao Ram (the subject properties and the surrounding areas) have just recently received significant attention by the mining industry, two of the known sites have only been mined on a limited scale for a few years, and the ore zones are known to be rather continuous to the extent drilling has defined them to date. However, the general area of interest has not been investigated in any detail. The specific areas have been explored by driving adits to the mineralized zones and by following the zones for at least a few thousand meters in the Hop Hoa mine for example.

On the basis of geological potential alone, the area of interest has not received the attention it deserves on technical grounds. New regulations have been implemented to streamline mine permitting at both the local and national levels, combined with appropriate environmental controls to protect human health and the environment. Once the new regulations from the federal government go into effect it will go a long way toward improving the climate for investing in mining projects in Vietnam and in bolstering Vietnam's economy to provide improved infrastructure and education for the people of Vietnam.

Section 13.0 Cam Vao Gold Ore Processing Facility

During the I2M visit to the subject area, the mine owners conducted a tour of the Cam Vao gold processing plant (see Figure 64). The plant contains a circuit for crushing (Figure 65) and one for removing metals by flotation (Figure 66), followed by a cyanide recovery system to recover gold. Primary and final filtration systems (Figure 67) have been employed to remove the ultra-fine grained material creating gold matte that is then dissolved in acid, and with the aid of a flux, the matte is fired and gold dore is poured containing mostly gold but likely containing silver and other metals as well.

Ore from the Hop Hoa mine, for example, is a mixture of unoxidized sulfide with pyrite, but some ore contains free gold that is only available via fine crushing followed by either gravity separation or cyanide treatment after roasting the ore. This liberates the gold in ultrafine particles which is trapped via filtration and subsequently fire fluxed to produce dore. Based on the reported fineness of the gold, the electrum contains about 80% gold and less than 20% silver and other metals (e.g., lead, zinc, nickel, antimony, and a few other metals).

Figure 64 – Mr. Lindstrom at the Processing Plant.

The processing plant was not in operation during the I2M visit and was reported to have been shut down a few months earlier for environmental reasons. The plant systems were apparently constructed in the 1ate 1990s and appeared to be approaching the end of their usefulness by having only a few years remaining without requiring major overhaul of motors, seals, transfer piping, and waste detainment ponds, pits, or lagoons.

Figure 65 – Primary Crusher at the Processing Plant

Figure 66 – Flotation Cells at the Processing Plant

Figure 67 – Final Filtration System at Tailing Pond (Dry)

Figure 68 – Road Down from Plant toward Main Road

Section 14.0 Environmental Issues

While touring the plant property, the tailings pond area was observed by I2M personnel. There was no water in the pond and a breach in the detainment berm was noted. The pond was constructed adjacent to a dry stream, which indicated that fine-grained material had drained from the tailings pond into the stream. I2M was directed by Mr. Richard Poulden, CEO, WBG management to sample the recent tailing pile in back of the plant, the empty tailings pond area, and the stream sediment adjacent to the tailings pond, and to conduct the appropriate laboratory analyses via elemental scans and other methods for the purpose of determining the content of the tailings. Duplicate samples were taken at each sampling site. Further, two water samples were obtained from the rice paddies in front of the plant entrance (Figure 68), but these were confiscated during shipment of the samples in Hong Kong by security personnel.

Figure 69 – Plant Tailings

Figure 70 – Sampling Tailings' Pond Sediments

Figure 71 – Sampling Dry Creek Sediments

14.1 Sampling of Tailings

One trench was excavated to a depth of approximately two feet at each of the three sites (see Figures 69-71). Composite samples were collected by I2M personnel from the trench walls to represent the vertical exposure. After splitting the samples to a representative size, two samples weighing approximately 1 kilogram each from each site were submitted to the laboratory for analysis. The tailings material is evident in the creek bed in Figure 72.

Figure 72 – Sample Site at Pond Breach into Creek (Dry)

14.2 Analyses of Tailings

The analyses show that the sediments of all three sites exhibit high concentrations of arsenic, and exhibit elevated concentrations of cadmium, mercury, and lead (see leftmost six samples in Figure 73 and Table 4 below).

Whether these elements have been solubilized out of the sediment by rainfall and have entered the surface water and local groundwater in solution are uncertain. Although cyanide was used in the plant for gold recovery, this compound rapidly disassociates in the environment and does not persist in surface water or in groundwater.

Note that the arsenic levels in the tailings sample reflect those of the mineralized rock samples taken from outcrop in the areas of interest (see Figure 73). The same is likely true of the other elevated elements in the tailings samples as well.

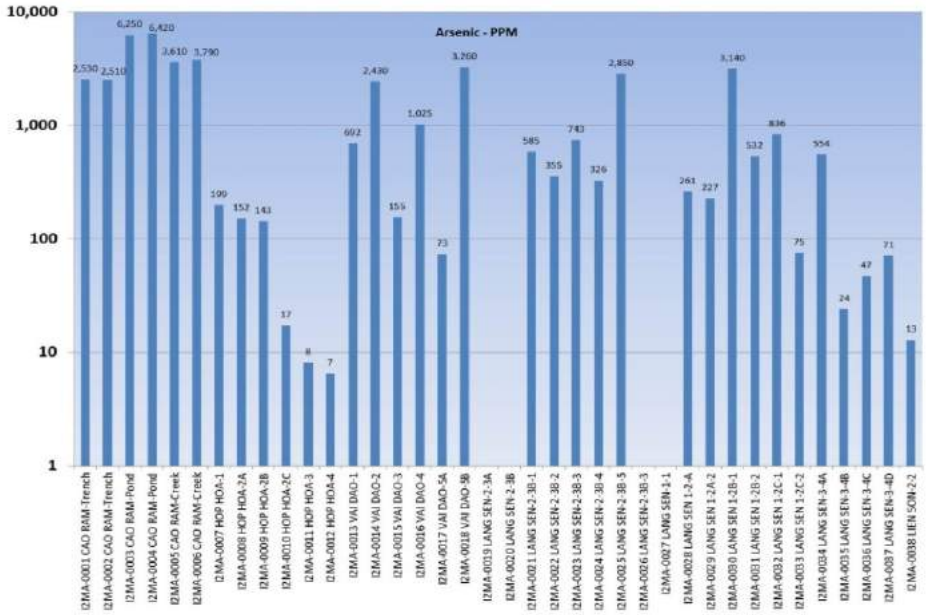


Figure 73 – Total Arsenic in All Samples Submitted to Laboratory
(Click on Figure to Enlarge)

Table 4

Tailings Geochemistry

Plant Trench, Tailings Pond and Stream Sediments
Arsenic, Cadmium, Mercury, and Lead

Sample ID#	Sample Area	Arsenic (ppm)	Cadmium (ppb)	Mercury (ppb)	Lead (ppm)
I2MA-0001	CAO Ram Trench	**2,530**	**620**	**178**	**47.0**
I2MA-0002	CAO Ram Trench	**2,510**	**560**	**182**	**41.9**
I2MA-0003	CAO Ram Pond	**6,250**	**860**	**346**	**42.7**
I2MA-0004	CAO Ram Pond	**6,420**	**870**	**342**	**45.8**
I2MA-0005	CAO Ram Creek	**3,610**	**660**	**158**	**30.9**
I2MA-0006	CAO Ram Creek	**3,790**	**730**	**177**	**33.5**
Detection Limit		**0.2**	**20**	**5**	**0.5**

In general, the more highly mineralized the rock, the higher the metal content and the higher values in the tailings. This is indicated in Table 4 above.

Section 15.0 Conclusions and Recommendations

Gold in the Doi Bu District east of the Cao Ram area of interest was formed in part in a compression, orogenic setting but its occurrence also has the characteristics of intrusion-related, epithermal mineralization. The gold occurs in quartz veins and in sulfides in fault-related mineralization, the latter primarily in association with massive pyrite and pyrrotite.

The structural setting has played a major role in the formation of the gold deposits. The major Song Da Structure outcropping to the NW of the area of interest (see Figure 5) has served to create a complex system of strike-slip and thrust faults that are highly favorable for trapping gold and other metals in hydrothermal mineralizing fluids. The resulting uplifted dome structure that characterizes the area of interest was formed within and after volcanic formations of the Vien Nam complex were injected during Late Jurassic to Early Cretaceous. During this period, a series of small-sized faults, fractures, and cataclastic zones containing quartz breccias, for example, were formed in these volcanic rocks around the margins of the uplifted dome and perhaps along favorable fault zones, especially those striking NW (see Figures 7A and 7B). Furthermore, geophysical data from gravity surveys indicate that there is indeed a large intrusive body of granodiorite or granite at relatively shallow depths in the area of interest which would have provided the fluids containing gold and other metals.

We have concluded that the area of interest exhibits all the geological and geophysical features required to justify a major exploration program. Furthermore, the data available on the Hop Hoa mine, and associated areas such as the old Vai Dao mine in the northwest of the area of interest, and the Lang Sen deposit and Lien Son mineralized zones south of the area of interest indicate that the properties are of sufficient merit to initiate such activity in these areas.

With the appropriate drilling programs to test the numerous zones at or near the surface, open-pit designs would likely be feasible to increase production well beyond that of current operations at the Hop Hoa mine.

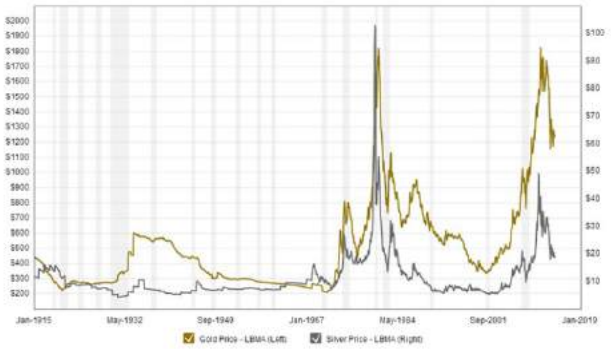
Open-pit mines usually have lower grades but produce far greater ounces of gold than underground operations (more). However, the Hop Hoa mine production could probably be expanded by adding production shifts, additional personnel, trucks, etc., but with the processing plant currently closed by government order, this is not possible unless another processing plant can be located for possible contract processing. A new ore processing plant could be designed and built possibly within 5 years, but a substantial exploration program consisting of geological mapping and outcrop sampling, a series of ground magnetics surveys, followed by drilling and coring of one or more mineralized zones would be required before the construction of a new plant would be justified economically.

We recommend that should a joint-venture with a Vietnamese partner be consummated, the next step is to begin the exploration program for the purpose of proving at least 10,000 ounces of gold in place. This should be followed by a feasibility study to determine the economic and practical viability of mining either by underground or open-pit methods, and of processing the ore with the new technology that is now available.

The long-term outlook of the gold price indicates that gold will remain above $1,000.00/ounce for the foreseeable future. Of course any major political instability and/or catastrophic economic or environmental cataclysmic event could cause a fundamental change in business activities. This would likely drive the gold price even higher, possibly lasting decades, while stability and improved production methods will contribute to lower costs. The issues of the mid-1970s and of 2008 show the impact on gold and silver prices in Figure 74.

We have concluded that based solely on geological factors, conducting gold mining in the area of interest could potentially be a successful venture. Establishing business relationships in the national government and relevant District offices would be mandatory. The need would also exist to develop local relationships with established partners, and by opening an exploration office in one of the villages near the Cam Ram area to support the field work that would be advisable for the exploration program.

Engaging geology professors as consultants, and graduates and students as field assistants from the major universities in Vietnam would be beneficial as a training program for the company and for Vietnam. The local inhabitants should also be engaged in various support functions to support the operations.



Prices from London Bullion Market Association (LBMA) Source:Macrotrends.net (more)

Figure 74 **- Gold Price Trends since 1915, in terms of 2010 US $**

To minimize fiscal risk to foreign companies interested in investing in the mining industry, the Government of Vietnam could be in a position to provide some form of guarantees or insurance against unforeseen malfeasance or misrepresentation by in-country business partners. There are international agencies that also could be interested in assisting Vietnam to build its economy by investing in the Vietnam's gold mining industry. The development of natural resources creates value for the companies involved, for the local businesses and workers, and for the district and national governmental agencies. With regulatory controls in effect, and with such operations monitored closely by the companies and regulatory agencies involved, any environmental issues surrounding such operations can be effectively controlled.

In the event a joint-venture is formed with the company owning the Cam Vao Processing Plant, a full environmental assessment should be conducted in and around the existing plant. The assessment should evaluate the soil for arsenic and other metals around the buildings and in the nearby surface water and groundwater, especially in and below the creek near the tailings pond. The areas downstream where the subject creek empties into the valley and rice paddies should also be evaluated for elevated arsenic, cadmium, mercury, and lead.

An affiliate of the United Nations, the World Bank, or other international agencies may also have an interest in underwriting or encouraging funding of the environmental assessment because elevated arsenic is a widespread problem resulting from over-pumping of groundwater resources in parts of the Red River Delta area of northern Vietnam, especially in the Hanoi and surrounding areas. The issue has received international attention by the news media (e.g., Bainbridge, 2013) and by scientific studies (e.g., Winkel, *et al.*, 2011, and Van Geen, *et al.*, 2013).

Signed in Houston, Texas this 25th day of May, 2014. We reserve the right to revise this report of investigations in the future as new information becomes available or as we deem appropriate.

Sincerely,

I2M Associates, LLC

Michael D. Campbell, P.G., P.H.
Executive Vice President & Chief Geologist

M. David Campbell, P.G.
Senior Geologist and Project Manager

Jeffrey D. King, P.G.
President, CEO, and Senior Program Manager

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Section 17.0 Appendices

Page

Appendix I

Geological and Geophysical Guides

for:

Hop Hoa, Vai Dao, (East of Cao Ram Area) Dia Chat, Xom Van Khu

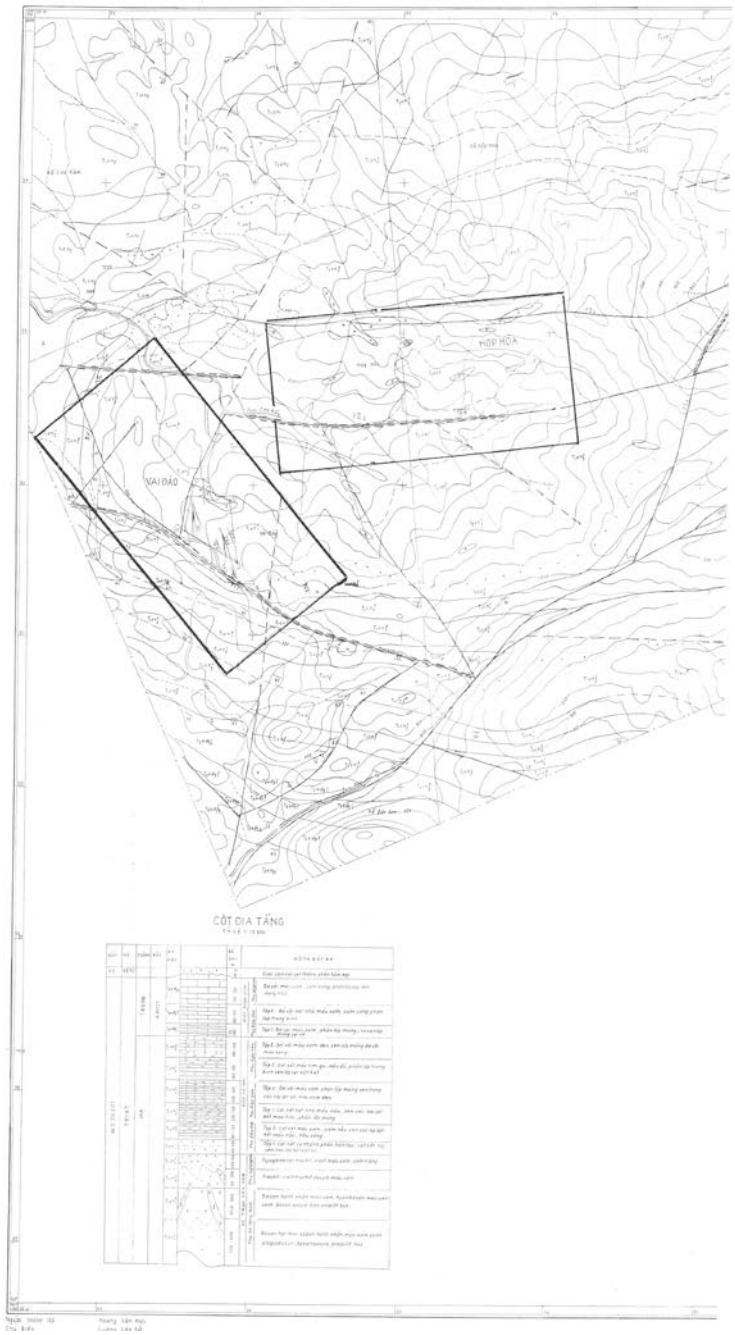


Figure 75 - License Boundaries and Reconnaissance Geological Mapping On Hop Hoa and Vai Dao Areas of Interest

Click Figure to Enlarge

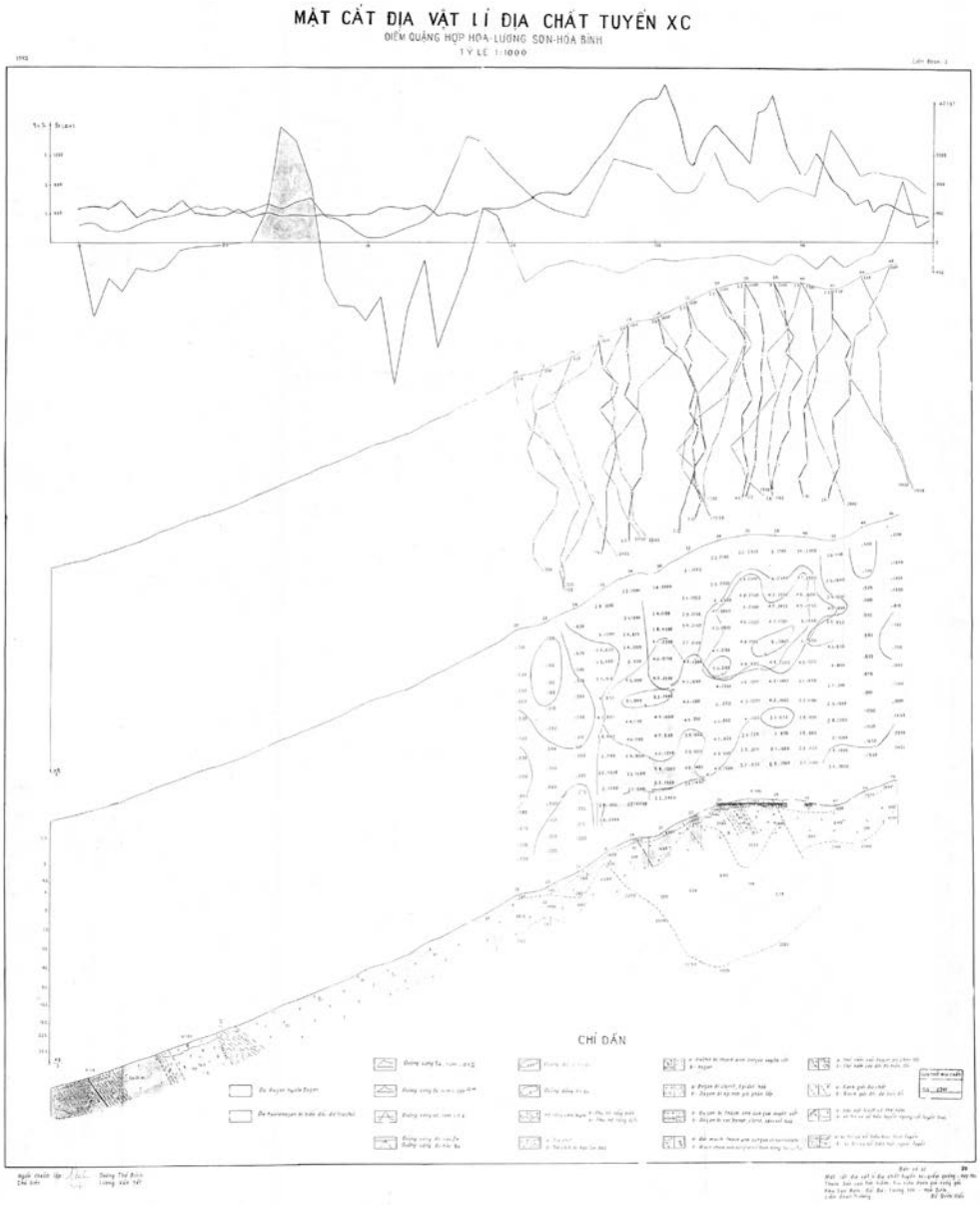
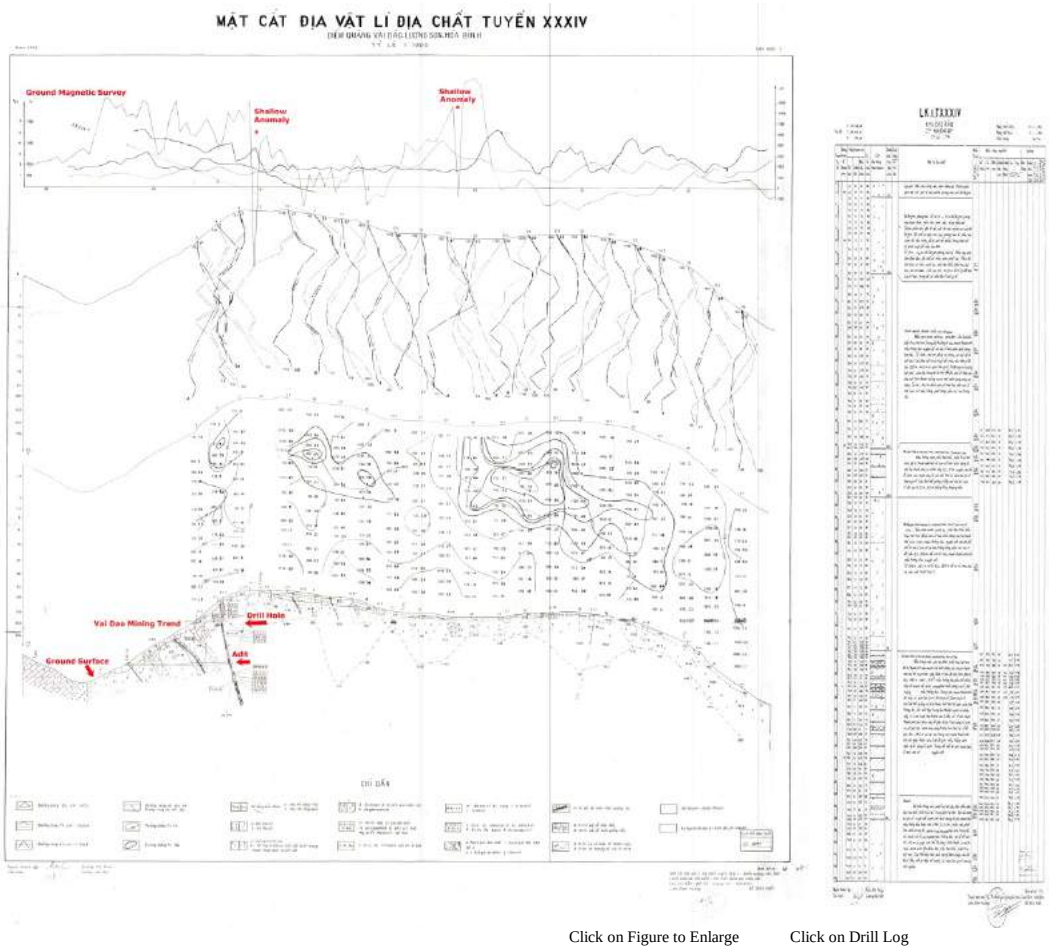


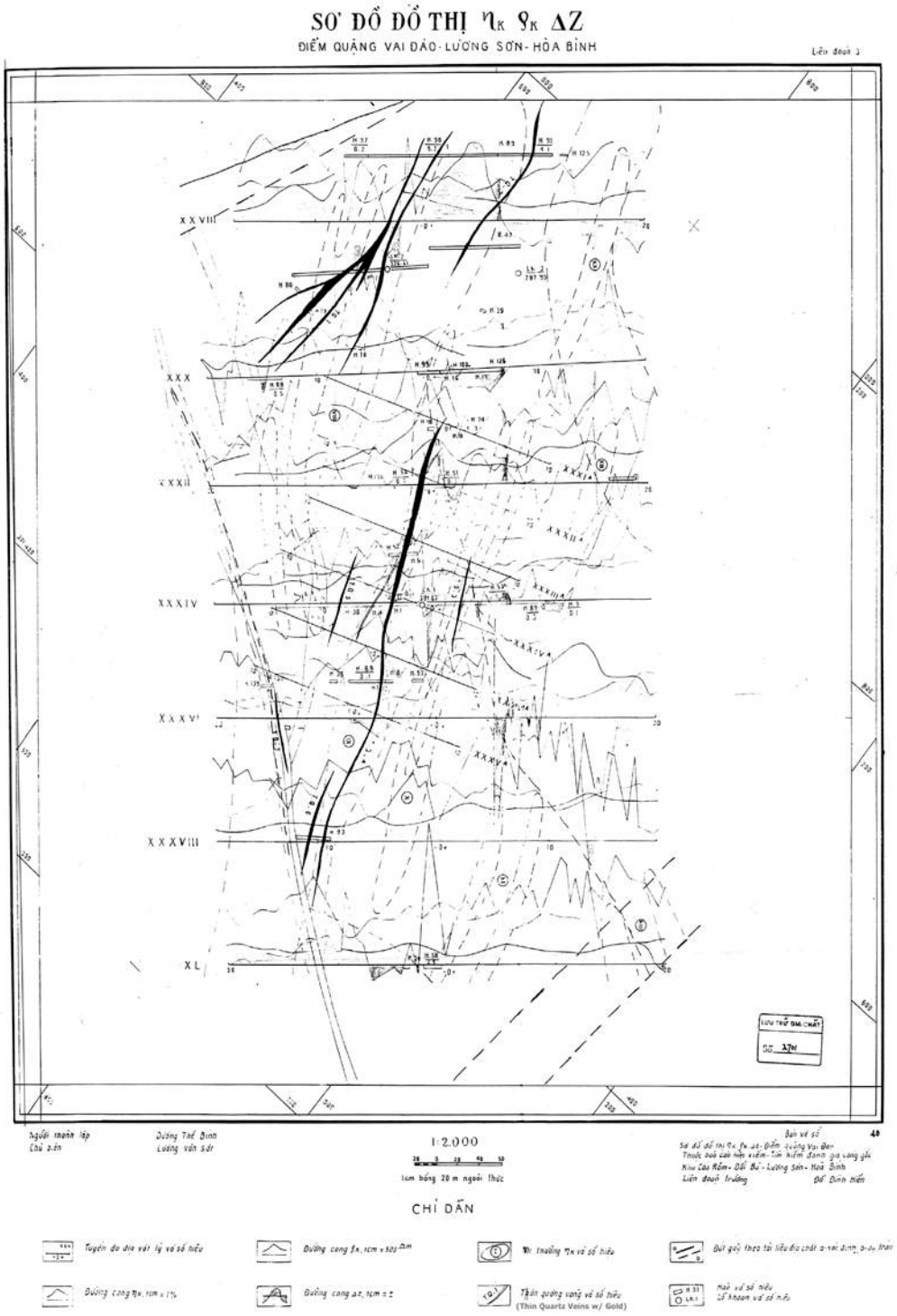
Figure 76 - Geophysics and Reconnaissance Geological Mapping – Hop Hoa Area

Click Figure to Enlarge



Click on Figure to Enlarge Click on Drill Log

Figure 77 - Geophysics and Reconnaissance Geological Mapping and Drilling – Via Dao Area



Click on Figure to Enlarge

Figure 78 - Geophysics and Detailed Geological Mapping – Vai Dao Area

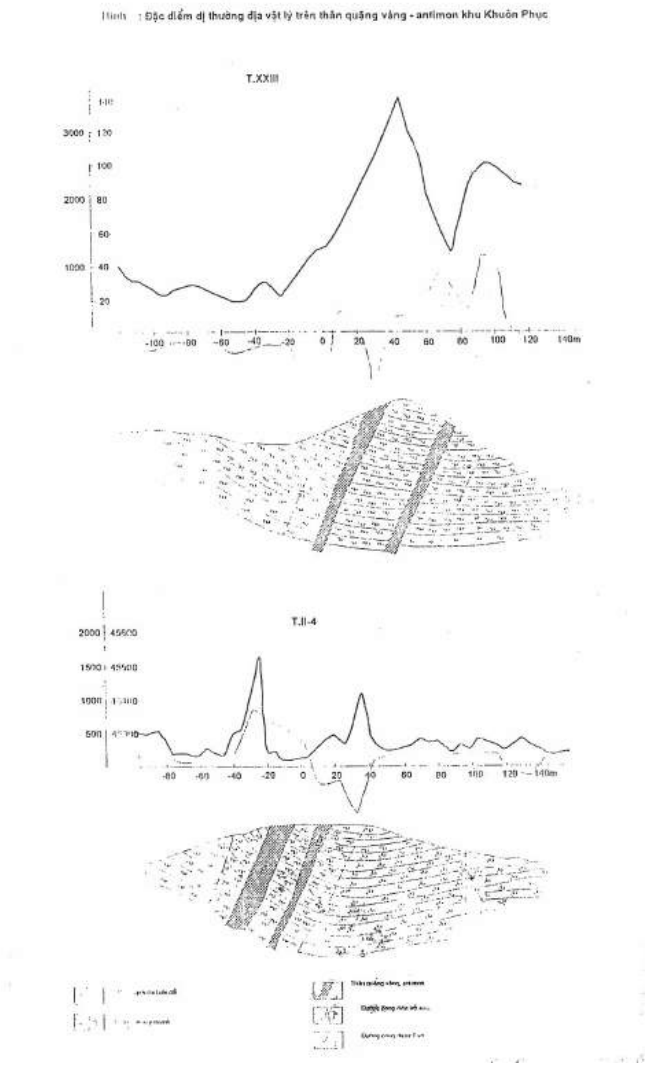
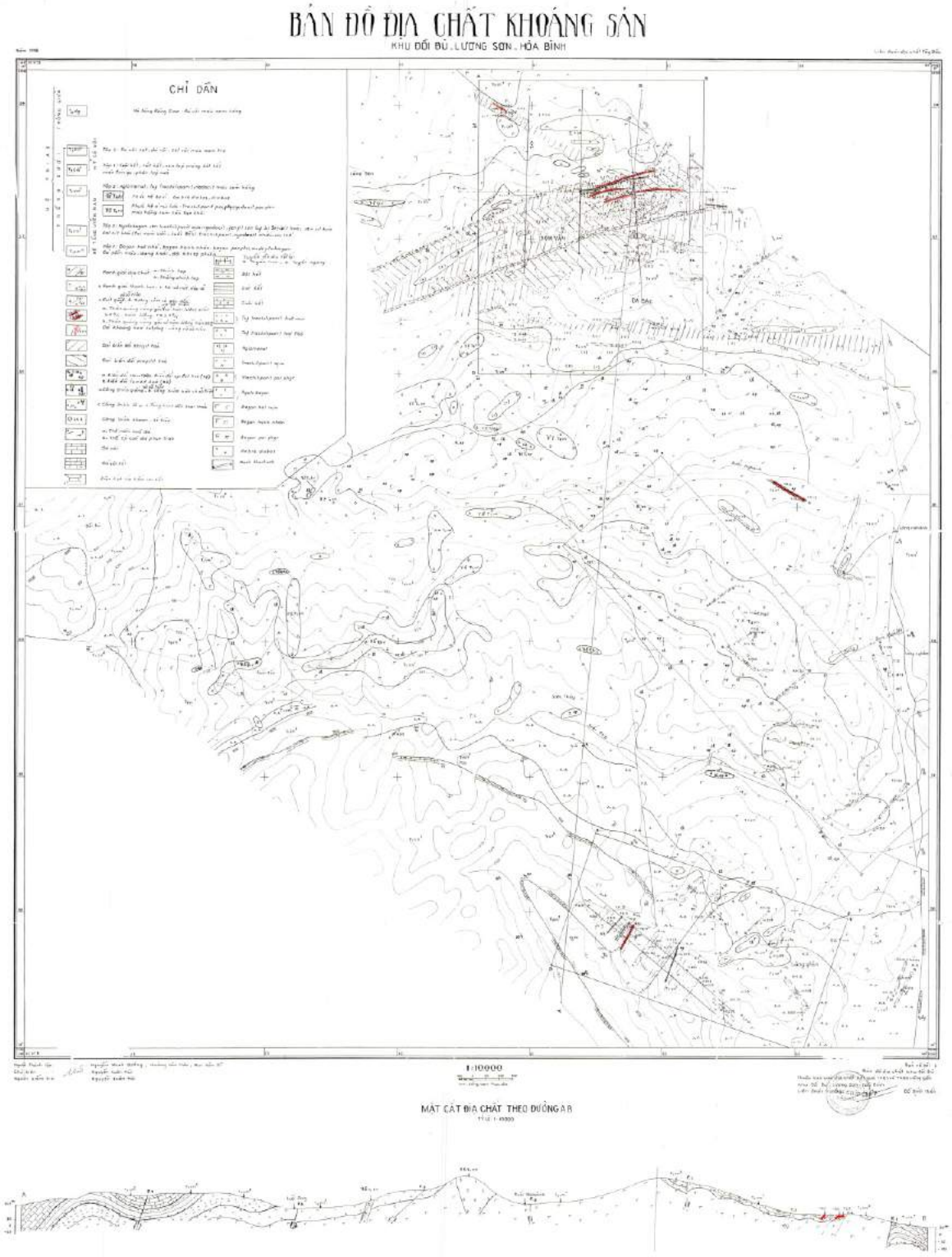
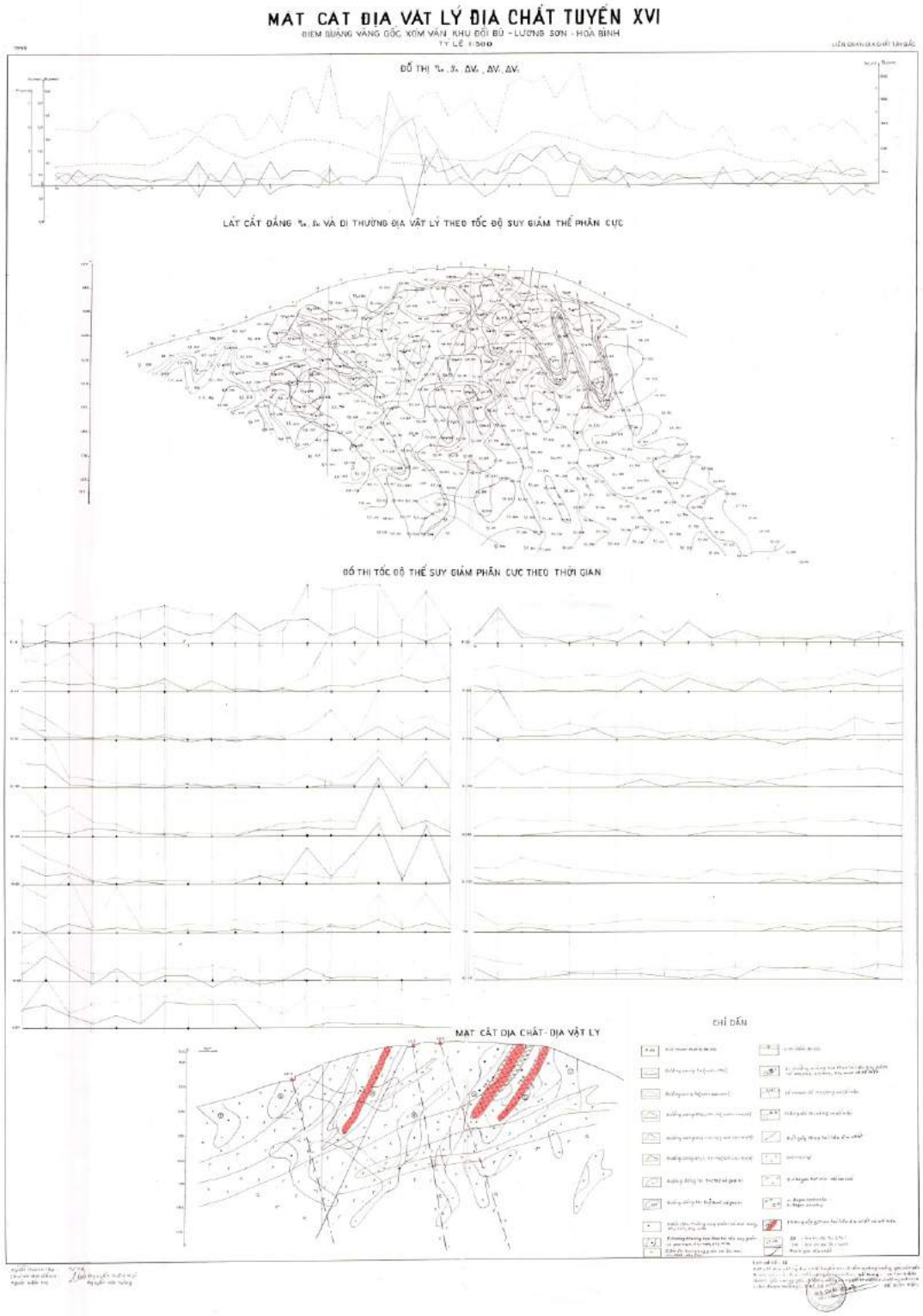


Figure 79 - Ground Magnetics Model Example



Click Figure to Enlarge

Figure 80 - Geophysics and Detailed Geological Mapping – Dia Chat Area



Click Figure to Enlarge

Figure 81 - Geophysics and Detailed Geological Mapping – Xom Van Khu Area

Appendix II

List of Standard Technical Abbreviations

Above mean sea level ..... amsl
Ampere ..... A
Annum (year) ..... a
Billion years ago ..... Ga
Centimeter ..... cm
Cubic centimeter ..... cm^3
Cubic feet per second ..... ft^3/s or cfs
Cubic foot ..... ft^3
Cubic meter ..... m^3
Day ..... d
Days per week ..... d/wk
Degree ..... °
Degrees Celsius ..... °C
Dry metric ton ..... dmt
Foot ..... ft
Gallons per minute (US) ..... gpm
Gram ..... g
Grams per liter ..... g/L
Grams per tonne ..... g/t
Greater than ..... >
Hectare (10,000 m^2) ..... ha
Horsepower ..... hp
Hour ..... h (*not* hr)
Hours per day ..... h/d
Hours per week ..... h/wk
Hours per year ..... h/a
Kilo (thousand) ..... k
Kilogram ..... kg
Kilograms per cubic meter ..... kg/m^3
Kilograms per hour ..... kg/h
Kilograms per square meter ..... kg/m^2
Kilojoule ..... kJ
Kilometer ..... km
Kilometres per hour ..... km/h
Kilonewton ..... kN
Kilopascal ..... kPa
Kilovolt ..... kV
Kilovolt-ampere ..... kVA
Kilovolts ..... kV
Kilowatt ..... kW
Kilowatt hour ..... kWh
Kilowatt hours per tonne (metric ton) ..... kWh/t

Kilowatt hours per year ..... kWh/a
Less than ..... <
Liter L
Liters per minute ..... L/m
Megabytes per second ..... Mb/s
Megapascal ..... MPa
Megavolt-ampere ..... MVA
Megawatt ..... MW
Meter ..... m
Meters above sea level ..... masl
Meters per minute ..... m/min
Meters per second ..... m/s
Micrometer (micron) ..... µm
Milliamperes ..... mA
Milligram ..... mg
Milligrams per litre ..... mg/L
Milliliter ..... mL
Millimeter ..... mm
Million ..... M
Million tonnes ..... Mt
Minute (plane angle) ..... '
Minute (time) ..... min
Month ..... mo
Ounce ..... oz
Parts per billion ..... ppb
Parts per million ..... ppm
Percent ..... %
Percent moisture (relative humidity) ..... % RH
Phase (electrical) ..... Ph
Pound(s) ..... lb
Second (plane angle) ..... "
Second (time) ..... s
Specific gravity ..... SG
Square centimeter ..... cm^2
Square foot ..... ft^2
Square kilometer ..... km^2
Square meter ..... m^2
Thousand tonnes ..... kt
Tonne (1,000 kg) ..... t
Tonnes per day ..... t/d
Tonnes per hour ..... t/h
Tonnes per year ..... t/a
Volt V
Week ..... wk
Wet metric ton ..... wmt

Appendix III

Glossary of Technical Terms

After Towsey, 2005

acid(ic)	In geology, a chemical classification of igneous rocks containing more than 66% silica. In chemistry, having a pH <7.
adamellite	(another term for quartz monzonite) is an intrusive igneous rock that has an approximately equal proportion of orthoclase and plagioclase feldspars with 5-20% quartz.
aeromagnetics	airborne geophysical survey measuring variations in the Earth's magnetic field
age	time unit of the geological time scale. A fourth-order unit, being a sub-division of Epoch, and occasionally sub-divided.
albite	sodium-rich feldspar. Common rock-forming mineral.
alteration	(zone/envelopes) change in mineralogical composition of a rock commonly brought about by reactions with hydrothermal solutions.
andalusite	an aluminum nesosilicate mineral with the chemical formula Al_2SiO_5. Andalusite is a common regional metamorphic mineral that forms under low pressure and moderate to high temperatures.
anomalous	a departure from the expected norm. In mineral exploration, this term is generally applied to either geochemical or geophysical data (values higher or lower than the norm).
anomaly	in mining terms, refers to geochemical or geophysical data that are values higher or lower than the norm.
arenite	a sedimentary clastic rock with sand grain size between 0.0625 mm (0.00246 in) and 2 mm (0.08 in) and containing less than 15% matrix.
arsenopyrite	an iron arsenic sulfide (FeAsS), it can be associated with significant amounts of gold. Consequently it serves as an indicator of gold-bearing quartz veins (reefs). Many arsenopyrite-gold ores are refractory, i.e. the gold is not easily liberated from the mineral matrix.
assay	chemical analysis. Strictly refers to analysis of precious metals by the fire-assay method with a gravimetric finish. Commonly used to mean any chemical analysis.

auriferous	containing gold (from Latin aurum meaning gold)
base metal	generally a metal inferior in value to the precious metals, mainly copper, lead zinc, nickel, tin and aluminum.
basic	igneous rocks, low in silica and rich in mafic minerals
basement	crustal layer of rocks beneath the overlying sedimentary strata
batholith	a large mass of consolidated intrusive igneous material (usually of granitic composition) (see also pluton).
bedding	arrangement of individual rock layers or beds.
bedrock	solid rock underlying soil, alluvium etc.
belt	a zone or band of a particular kind of rock strata exposed on the surface
biotite	black mica. Common rock-forming mineral, often associated with metamorphism or alteration.
block faulting	a type of normal faulting where the crust is divided into structural or fault blocks of different orientation and elevation
block model	the term applied to the final output of a computer based process to reflect the likely configuration of the mineralization and the surrounding material based on three-dimensional blocks.
boiling zone	zone at some vertical depth at which the rock pressure is low enough to allow fluids to boil. Important in epithermal deposits, as this creates a marked change in pressure and temperature, which can change the ore fluid composition and cause minerals to precipitate.
breakeven	in ore reserve estimation, the gold grade at which the mining cost equals the value of the extractable gold. At breakeven grades, the operation makes neither a profit nor a loss. Breakeven can be calculated at various cost levels, such as an operating breakeven (the grade required to continue operations) or total cost breakeven (which takes into account overheads such as depreciation, amortization, cost of capital, off-site overheads, interest, tax etc).
bullion	precious metals in bulk form are known as bullion and are traded on commodity markets. Bullion metals may be cast into ingots or minted into coins. The defining attribute of bullion is that it is valued by its mass and purity rather than by a face value as money.

Cambrian	time unit of the geological time scale, about 500-600 million years ago. Oldest subdivision of the Paleozoic Era.
carbonate	compound of carbon and oxygen with one or metals, especially calcium($CaCO_3$), magnesium ($MgCO_3$) and iron ($FeCO_3$).
Carboniferous	time unit of the geological time scale, a geological period, 360 to 286 million years ago. A sub-division of the Paleozoic Era
chalcopyrite	a copper iron sulfide mineral ($CuFeS_2$) that crystallizes in the tetragonal system. Chalcopyrite is present in volcanogenic massive sulfide ore deposits and sedimentary exhalative deposits, formed by deposition of copper during hydrothermal circulation chlorite dark green iron magnesium mineral, often associated with metamorphism or alteration.
clast	particle or fragment
clastic	composed of particles or fragments
cleavage	planar fracture or parting in rock formed by deformation
co-magmatic	formed during the same igneous event.
cordierite	a magnesium iron aluminum cyclosilicate mineral in a solid-solution series between the magnesium-rich and iron-rich varieties, typically occurring in contact or regional metamorphism of argillaceous rocks. It is especially common in hornfels produced by contact metamorphism of mudstones.
costeaning	The removal of soil and subsoil to expose rock formations in prospecting for quartz veins (reefs) or lodes. Also, proving an ore deposit or vein by trenching across its outcrop at approximate right angles and lastly, tracing a lode by pits sunk through overburden to underlying rock.
country rock	the enclosing rock around a body of ore
craton	a stable part of the Earth's crust, in which deformation has been only visible for a prolonged period.
Cretaceous	time unit of the Geological Time Scale, a geological Period, about 144 to 65 million years ago, a sub-division of the Mesozoic Era.
cross-cut	mining passage constructed at right angles to the general trend of the ore body (see also drive, shaft, rise and winze)

cross-section	a section, usually vertical, through an ore body or geological model at right angles to the dip of the unit
cut-off	the estimated lowest grade of ore that can be mined and treated profitably in a mining operation.
cuttings	broken pieces of rock generated by a drill bit during drilling. Forms the main part of percussion drill samples.
density	mass divided by volume. Measured here in tonnes per cubic meter.
Devonian	time unit of the Geological Time Scale, a geological Period, 416 – 359 million years ago
diamond drilling	method of obtaining a cylindrical core of rock by drilling with a diamond impregnated bit.
dilution	reduction in grade resulting from admixture of lower grade material during mining or rock-breaking processes.
disseminated	mineralization more or less evenly distributed throughout a rock.
drill cross section	a section perpendicular to strike on which the trace of drill holes are plotted.
drill intercepts	the intersections (usually of the target mineralization) made within an exploration drill hole.
drive	horizontal mining passage or access way underground, oriented along the length or general trend of the ore body (noun and verb)(see also cross-cut).
dike	a tabular body of igneous rock, cross cutting the host strata at a high angle.
electrum	a naturally occurring alloy of gold and silver, with trace amounts of copper and other metals.
epigenetic	mineral deposit of later origin than the enclosing rocks.
fault	a fracture in rocks along which rocks on one side have been moved relative to the rocks on the other.
feasibility study	a comprehensive study of technical, financial, economic and legislative matters of sufficient depth and accuracy to provide the basis for financing.
felsic	igneous rock composed principally of feldspars and quartz.
ferruginous	rich in iron.

fire assay — assay procedure involving roasting of a sample in a furnace to ensure complete extraction of all the contained metal.

fluid inclusion — bubbles of gas and/or liquid, sometimes containing crystals, within mineral grains that can be used to determine the temperature and pressure of formation of the mineral and provide data on the chemical composition of the original fluids.

foliation — laminated structure in rocks caused by alignment of platy mineral grains, usually as a result of deformation and/or metamorphism

footwall — the wall or surface on the underside of an inclined geological feature such as a fault, vein, ore-body or stope.

fracture — a break in the rock that may show shearing or not. May be a joint, without movement on either side of the fracture.

Fry analysis — Fry analysis is a statistical method of correlating data points to see if there is a preferred direction. It offers a visual approach to quantify characteristic spatial trends for groups of point objects. See Fry, N. 1979. Random point distributions and strain measurement in rocks. *Tectonophysics* Vol. 60, pp. 806-807.

gabbro — coarse grained dark igneous rock of basic composition. A coarse-grained variety of basalt.

galena — lead sulphide mineral, an ore of lead often containing silver.

gangue — waste minerals associated with ore

geological mapping — the recording in the field of geological information on a map.

geophysical techniques -the exploration of an area in which physical properties (e.g. resistivity, conductivity, magnetic properties) unique to the rocks in the area are quantitatively measured by one or more methods.

geostatistics — mineral resource estimation method. A computer based method wherein particular relationships between sample points are established and employed to project the influence of the sample points. Based on the application of statistics to the variation in grade of ore bodies.

gossan — intensely oxidized, weathered or decomposed rock or soil, usually the upper and exposed part of an ore deposit or mineral vein visible on the surface.

granite, granitic	coarse grained igneous rock composed of quartz and feldspar with varying amounts of ferromagnesian minerals such as biotite or hornblende, with or without muscovite. Adjective is 'granitic'.
granitoid	field term for a body of rock of granitic composition (containing quartz).
gravity survey	geophysical survey technique measuring variations in the Earth's gravitational field, due to variations in rock densities.
greywacke	a variety of sandstone generally characterized by its hardness, dark color, and poorly sorted angular grains of quartz, feldspar, and small rock fragments or lithic fragments set in a compact, clay-fine matrix.
greisen	a highly altered granitic rock or pegmatite, formed by autogenic alteration of a granite and is a class of skarn. Greisens are prospective for mineralisation because the last fluids of granite crystallization tend to concentrate incompatible elements such as tin, tungsten, molybdenum and fluorine, as well as metals such as gold, silver, and occasionally copper.
hanging wall	the wall or surface on the upper side of an inclined geological feature such as a fault, vein, ore body or stope.
head grades	a general term referring to the grade of ore delivered to the processing plant.
hornfels	a hard, very fine grained rock which is the group designation for a series of contact metamorphic rocks which have been baked and indurated by intrusive igneous masses.
hydrothermal	pertaining to heated water (hot aqueous solutions), associated with the formation of mineral deposits or the alteration of rocks.
igneous	rocks formed by solidification from the molten state deep underground.
Indicated Resource	an 'Indicated Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

Inferred Resource	an 'Inferred Mineral Resource' is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which may be limited or of uncertain quality and reliability.
in-situ	term used to describe rocks and minerals found in their original position of formation. Or, mineral resources considered to be "in place."
intermediate	igneous rocks between acid and basic in composition.
intrusive	an igneous rock that has intruded previously existing rocks.
isochron	a term used in the determination of radiometric age dates. If the plot comparing daughter/non-isotope ratios with parent/non-isotope ratios falls on a straight line, that line "of equal time" is called an isochron.
isoclinal folds	intensely folded rock layers where the inter-limb angle is between 10° and zero, giving the impression of parallel rock layers.
isotope	different atoms of the same element, having the same atomic number but different atomic weights. The ratios of different isotopes in rocks and minerals can be used to estimate the age of the specimen or the time of crystallization or thermal events.
joint	fracture in rock along which no appreciable movement has occurred.
JORC Code	the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2004 Edition", a report of the joint committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Australian Mining Industry Council. It is a comprehensive integrated exposition on geological resources and ore reserves, and adherence to the Code is a requirement under the Australian Stock Exchange Listing Rules.
km	kilometer(s)
level	underground horizon at which an ore body is opened up and from which mining proceeds.
lineament	long major topographic feature identified on aerial photograph, which may or may not be a fault or joint.

lithic	pertaining to or formed of rock
lithological	pertaining to the type of rock.
lode	tabular or vein-like deposit of valuable mineral between well-defined walls.
mafic	describing silicate mineral or rock that is rich in magnesium and iron. Most mafic minerals are dark in color and the relative density is greater than 3. Common rock-forming mafic minerals include: olivine, pyroxene, amphibole, and biotite. Common mafic rocks include basalt, dolerite, and gabbro.
Measured Resource	a 'Measured Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and/or grade continuity.
metamorphism	an assemblage of rocks that have been subjected to intense heat and pressure of sufficient duration to alter the pre-existing minerals to different mineral types that were stable in such environments.
microthermometry	determination of the temperature of formation of minerals by examining, heating and cooling fluid inclusions under a microscope.
migmatite	a rock at the frontier between igneous and metamorphic rocks. Migmatites form under extreme temperature conditions during prograde metamorphism, where partial melting occurs in pre-existing rocks.
mineralization	the introduction of valuable minerals into a rock body
muscovite	a white mica mineral
nugget	fragment of native gold, often water-worn
nugget effect	a bias produced in geostatistics caused by isolated high values
open cut	synonymous with open pit
open pit	mine excavation or quarry, open to the surface
Ordovician	time unit of the Geological Time Scale, a geological Period from 500 to 440 million years ago, a sub-division of the Paleozoic Era

ore	rock or mineral(s) that can be extracted at a profit. Often applied (incorrectly) to mineralization in general.
Ore Reserve	an 'Ore Reserve' is the economically mineable part of a Measured or Indicated Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Ore Reserves are sub-divided in order of increasing confidence into Probable Ore Reserves and Proved Ore Reserves
ore shoot	pods of mineralized material, often high grade, within a vein
orthoclase	potassium feldspar
outcrop	a body of rock exposed at the ground surface
oxidized	near surface or after-mining decomposition of rocks, minerals or metals by exposure to the atmosphere and ground water.
Paleozoic	Time unit of the Geological Time Scale, a geological Era from 600-251 million years ago
pegmatite	coarse grained igneous rocks, similar to granite, often very coarse grained, rarely with crystals tens of meters in length. May contain rare or unusual minerals or metals. Often occurs as dykes or veins.
percussion drilling	method of drilling using a hammering action with rotation, forcing dust and cuttings to the hole collar by compressed air. Usually refers to open hole percussion drilling, where cuttings return outside the drill rods. See also RAB drilling and RC drilling
Permian	Time unit of the Geological Time Scale, a Period from 280-251 million years ago, a sub-division of the Paleozoic Era
petrography	the study of rocks under the microscope
petrology	the study of the origin, structure and occurrence of rocks

pH	literally, “power of Hydrogen”. A measure of the concentration of hydrogen ions in solution that determines acidity or alkalinity. The pH ranges from 0 to 14, with 7 being neutral. Acids have a pH less than 7 and alkalis greater than 7
plagioclase	group of feldspar minerals ranging from sodium-rich to calcium-rich with mixed compositions in between
potassic alteration	type of alteration due to introduction or increase of the alkali metal potassium.
portal	surface entrance to a tunnel or drive.
pre-feasibility study	a relatively comprehensive analysis which is qualified by the uncertainty of fundamental criteria and assumptions to the degree that it cannot be the basis for a final financial analysis
Probable Ore Reserve	a ‘Probable Ore Reserve’ is the economically mineable part of an Indicated, and in some circumstances Measured, Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. A Probable Ore Reserve has a lower level of confidence than a Proved Ore Reserve.
prospect	an area that warranted or warrants detailed exploration.
Proved Ore Reserve	a ‘Proved Ore Reserve’ is the economically mineable part of a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.
pyrite	an iron sulphide mineral, often associated with economic mineralization. Occasionally used as an ore of sulphur. With inclusion high amounts of arsenic, the mineral becomes arsenopyrite.

pyroxene family of silicate minerals that usually contain iron and magnesium and commonly calcium.

quartz very common minerals composed of silica, SiO_2. Amethyst is a variety of the well-known amethystine color. Aventurine is a quartz spangled form with scales of mica, hematite, or other minerals. False topaz or citrine is a yellow quartz. Rock crystal is a clear variety. Rose quartz is a pink variety, and cairngorm is a brownish variety. Tiger-eye is crocidolite (an asbestos-like material) replaced by silica and iron oxide. Quartz is the name of the mineral prefixed to the names of many rocks that contain it, such as quartz porphyry, quartz diorite.

RAB drilling see Rotary Air Blast

raise see Rise

RC drilling see Reverse Circulation

recovered grades means the eventual recovery after mining dilution and processing losses measured against plant feed tonnes.

recovery (drilling) proportion (%) of core or cuttings actually recovered from a cored interval, compared to the maximum theoretical quantity.

recovery factors the mining and metallurgical factors affecting recovery of gold through a plan of grade-quantity control of ore or metal relative to its other constituents.

reef in older mining terms, a white gold-bearing quartz vein.

reserves (ore) see Proved or Probable Ore Reserves. It is recommended that the reader study the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2004 Edition", a report of the joint committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Australian Mining Industry Council for a comprehensive integrated exposition on geological resources and ore reserves. The various resource categories are classified according to the level of geological information, and thus the confidence, underlying the estimate.

The Inferred Resources cannot become a Reserve. The Proved and Probable Reserves are derived respectively from the Measured and Indicated Resource after the application of sufficient technical, financial, marketing, economic, legislative, legal and environmental factors to be confident that their mining and processing would be economically

viable. However, it should be appreciated that the Code does not define a level of profitability.

resource — see Measured, Indicated or Inferred Mineral Resource. Mineralization to which conceptual tonnage and grade figures are assigned, but for which exploration data are inadequate to estimate ore reserves.

reverse circulation drilling — Method of drilling whereby rock chips are recovered by pressurized air returning inside the drill rods.

reverse fault. — a fault that dips towards the block that has been relatively raised.

rise, raise — a vertical or inclined underground shaft or access way between levels mined from the bottom up.

rock-chip sampling — obtaining a sample, generally for assay, by breaking chips off a rock face.

Rotary Air Blast (RAB) Drilling — Method of drilling soft rocks in which the cuttings from the bit are carried to the surface by pressurized air returning outside the drill rods.

schist — type of fine grained metamorphic rock with laminated fabric similar to slate but often showing a sheen.

scoping study — a study having the objective of defining what options, if any, should be subject to intensive analysis.

sediment — particles deposited from suspension in water, wind or ice consisting of clay or quartz particles.

sequence — group of sedimentary rocks.

sericite — fine grained variety of mica generally formed by metamorphic processes.

S.G. — Specific Gravity

shaft — a vertical or inclined passage from the surface by which a mine is entered and through which ore or ventilation air is transported.

shear — zone in which rocks have been deformed by lateral movement along innumerable parallel planes.

sheeted vein — groups of closely spaced distinct parallel fractures filled with mineral matter and separated by layers of barren rock.

silicified	referring to rocks in which a significant proportion of the original constituent minerals have been replaced by silica.
Silurian	time unit of the Geological Time Scale, a Period from about 438 to 408 million years ago.
skarn	rock type refers to calcium-bearing rocks containing a range of silicate minerals, and is most often formed at the contact zone between intrusions of granodiorites, granites, or other high-temperature intrusives with limestone or other calcareous units.
Specific Gravity	mass divided by volume at a specified temperature compared to an equal amount of water which is assigned an SG of 1.0. Equivalent to density (mass per unit volume), measured here in tonnes per cubic meter.
sphalerite	zinc sulphide mineral.
staurolite	a complex iron, aluminum nesosilicate mineral with iron, zinc and magnesium in variable ratios. It is an index mineral for intermediate- to high-grade metamorphics.
stockwork	interlocking network of tabular veins or lobes.
stope	mine excavation from which ore is being or has been extracted.
stratigraphy	study of stratified rocks, especially their age, correlation and character.
stream sediment survey	systematic sampling of sediments within drainage channels, used to locate traces of mineralization which have weathered from the ore zone and been shed into the drainage channels.
strike	the azimuth of a surface, bed or layer of rocks in the horizontal plane.
stringer	narrow vein or irregular filament of mineral traversing a rock mass.
sulphides	minerals comprising a chemical combination of sulphur and metals.
supergene	as in supergene enrichment, is a process occurring relatively near the surface where ground-water circulation occurs with concomitant oxidation and chemical weathering. The descending ground water oxidizes the primary (hypogene) sulfide ore minerals and redistribute the metallic ore elements where they enrich the base of the oxidized portion of the deposit.
syenite	medium to coarse-grained, acidic igneous rock, containing much less silica than a granite.

tailings	material rejected from a treatment plant after the recoverable valuable minerals have been extracted.
tonalite	igneous rock similar to granite but containing mainly calcium feldspar rather than alkali (sodium and potassium) feldspar.
true width	width or thickness of a lode or other formation measured at right angles to its sides (see also apparent width)
variogram	a statistical model, usually presented as a graph, that describes the average Inferred Mineral
variography	a statistical study of the way in which metal or grade distribution varies within a deposit and the relationship between adjacent samples. It is used in order to determine grade continuity within a geological or computer model of the ore body, and to estimate the range of influence of samples.
vein	a narrow dyke-like intrusion of mineral traversing a rock mass of different material.
volcanic	class of igneous rocks that have flowed out or have been ejected at or near the earth's surface, as from a volcano.
volcanoclastic	description of a clastic sediment containing material of volcanic origin.
volcanogenic.	of volcano origin.
wall rock	rock mass adjacent to a fault, fault zone or lode.
winze	a vertical or inclined underground shaft or access way between levels mined from the top down.

Appendix IV

ALS Laboratory Data Sheets

ALS minerals

ALS USA Inc.
4977 Energy Way
Reno NV 89502
Phone: 775 356 5395 Fax: 775 355 0179 www.alsglobal.com

To: I2M ASSOCIATES, LLC
1810 ELMEN STREET
HOUSTON TX 77019

Page: 1
Finalized Date: 24-FEB-2014
This copy reported on 25-FEB-2014
Account: MASSOC

CERTIFICATE RE14018921

Project:
P.O. No.:
This report is for 38 Rock samples submitted to our lab in Reno, NV, USA on 11-FEB-2014.
The following have access to data associated with this certificate:
MICHAEL D. CAMPBELL

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
BAG-01	Bulk Master for Storage
PUL-QC	Pulverizing QC Test
CRU-QC	Crushing QC Test
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-32	Pulverize 1000g to 85% < 75 um
CRU-21	Crush entire sample >70% -6 mm

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
ME-MS61	48 element four acid ICP-MS	
Hg-MS42	Trace Hg by ICPMS	ICP-MS
Au-AA25	Ore Grade Au 30g FA AA finish	AAS

The results of this assay were based solely upon the sample of the sample submitted. Any decision to invest based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him/her and based on an evaluation of all engineering data which is available concerning any proposed project. Statement required by Nevada State Law NRS 519

To: I2M ASSOCIATES, LLC
ATTN: MICHAEL D. CAMPBELL
1810 ELMEN STREET
HOUSTON TX 77019

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.
***** See Appendix Page for comments regarding this certificate *****

Signature: Gael McGibbon, Director of Operations USA

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Page: 2 - A
Total # Pages: 2 (A - D)
Plus Appendix Pages
Finalized Date: 24-FEB-2014
Account: MASSOC

CERTIFICATE OF ANALYSIS RE14018921

Sample Description / Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA25 Au g/t 0.01	ME-MS61 Ag ppm 0.01	ME-MS61 Al % 0.01	ME-MS61 As ppm 0.2	ME-MS61 Ba ppm 10	ME-MS61 Be ppm 0.05	ME-MS61 Bi ppm 0.01	ME-MS61 Ca % 0.01	ME-MS61 Cd ppm 0.02	ME-MS61 Ce ppm 0.01	ME-MS61 Co ppm 0.1	ME-MS61 Cr ppm 1	ME-MS61 Cs ppm 0.05	ME-MS61 Cu ppm 0.2
I2MA-0001 CAO RAM-Trench	1.03	0.80	0.20	4.52	2530	210	1.67	0.17	3.14	0.62	50.9	22.9	134	2.70	75.8
I2MA-0002 CAO RAM-Trench	1.19	0.43	0.20	4.40	2510	200	1.53	0.14	3.08	0.56	46.8	21.5	131	2.53	69.3
I2MA-0003 CAO RAM-Pond	1.21	0.77	0.32	4.26	6250	200	1.56	0.16	2.38	0.86	45.8	26.6	130	2.43	99.9
I2MA-0004 CAO RAM-Pond	1.09	0.84	0.32	4.33	6420	200	1.72	0.18	2.41	0.87	50.3	27.1	128	2.52	102.5
I2MA-0005 CAO RAM-Creek	0.98	0.44	0.19	4.22	3610	200	1.39	0.10	2.67	0.66	42.2	22.1	151	2.18	72.2
I2MA-0006 CAO RAM-Creek	1.07	0.42	0.22	4.29	3790	200	1.51	0.11	2.66	0.73	46.3	24.6	154	2.44	75.9
I2MA-0007 HOP HOA-1	1.14	25.6	1.12	1.09	199.0	200	2.02	0.02	0.04	0.04	33.2	1.3	21	1.20	49.8
I2MA-0008 HOP HOA-2A	0.71	0.03	0.10	9.10	152.0	190	3.90	0.14	0.01	0.02	245	29.1	54	2.50	136.5
I2MA-0009 HOP HOA-2B	0.63	0.02	0.22	7.62	143.0	280	2.89	0.34	<0.01	0.03	195.0	41.6	47	2.26	147.0
I2MA-0010 HOP HOA-2C	1.21	<0.01	0.02	7.15	17.2	30	0.72	0.16	0.94	0.02	15.25	9.3	11	6.59	52.9
I2MA-0011 HOP HOA-3	0.48	<0.01	0.04	7.04	8.1	20	0.44	0.02	6.93	1.59	19.00	6.7	36	4.80	34.1
I2MA-0012 HOP HOA-4	1.36	<0.01	0.05	7.47	6.5	70	0.66	0.04	3.47	0.19	62.6	60.8	53	2.42	141.5
I2MA-0013 VAI DAO-1	0.91	1.94	0.27	0.19	692	10	0.19	0.58	0.74	0.43	1.34	36.8	24	0.43	19.4
I2MA-0014 VAI DAO-2	0.55	8.69	0.73	0.98	2430	40	0.49	0.08	1.04	<0.02	8.66	46.1	21	0.41	459
I2MA-0015 VAI DAO-3	0.32	0.69	0.16	4.16	154.5	110	1.20	0.08	3.15	<0.02	34.9	22.1	28	1.63	221
I2MA-0016 VAI DAO-4	1.29	2.96	0.49	0.07	1025	10	0.20	0.90	0.57	0.35	0.67	46.4	26	0.35	27.1
I2MA-0017 VAI DAO-5A	0.65	0.03	0.08	5.57	73.3	300	2.67	0.02	5.93	0.14	53.1	33.4	32	2.35	16.0
I2MA-0018 VAI DAO-5B	1.09	1.55	0.06	0.07	3260	20	0.08	0.11	0.45	0.06	0.54	15.5	27	0.08	3.8
I2MA-0019 LANG SEN-2-3A	1.44	0.01	0.06	0.35	>10000	10	<0.05	0.01	0.01	0.80	0.37	0.4	11	0.10	28.9
I2MA-0020 LANG SEN-2-3B	0.85	4.95	1.55	0.04	>10000	<10	<0.05	1.01	<0.01	0.22	1.20	46.9	23	<0.05	388
I2MA-0021 LANG SEN-2-3B-1	1.01	0.56	0.41	0.02	585	<10	<0.05	0.12	0.01	<0.02	15.65	46.1	13	<0.05	647
I2MA-0022 LANG SEN-2-3B-2	2.14	0.01	0.19	7.27	355	700	5.38	0.06	0.11	0.35	81.5	21.5	53	3.37	171.0
I2MA-0023 LANG SEN-2-3B-3	0.99	0.03	0.24	1.66	743	90	0.40	0.02	0.01	0.33	15.30	15.2	28	2.08	557
I2MA-0024 LANG SEN-2-3B-4	1.13	5.19	2.42	0.14	326	10	0.20	0.14	0.01	0.02	10.40	53.6	15	0.07	946
I2MA-0025 LANG SEN-2-3B-5	1.45	0.50	0.28	0.17	2850	20	0.97	0.03	0.03	0.08	2.05	24.0	34	0.15	436
I2MA-0026 LANG SEN-2-3B-3	Not Recvd														
I2MA-0027 LANG SEN-1-1	0.35	11.30	2.25	1.19	>10000	390	0.76	1.05	0.02	0.49	27.1	48.6	35	0.45	256
I2MA-0028 LANG SEN 1-2-A	0.54	0.78	0.96	0.02	261	10	<0.05	1.92	<0.01	0.04	2.97	109.0	5	<0.05	329
I2MA-0029 LANG SEN 1-2A-2	0.85	0.03	0.18	0.02	227	10	<0.05	0.01	<0.01	<0.02	0.51	1.2	30	<0.05	18.7
I2MA-0030 LANG SEN 1-2B-1	1.15	0.31	0.40	0.05	3140	<10	<0.05	0.09	<0.01	0.02	13.30	47.8	16	<0.05	519
I2MA-0031 LANG SEN 1-2B-2	1.13	3.33	6.70	0.09	532	<10	0.05	0.02	<0.01	0.02	0.95	1.8	24	<0.05	107.0
I2MA-0032 LANG SEN 1-2C-1	1.08	1.27	0.40	0.44	836	50	0.34	0.31	0.21	0.06	3.67	60.2	24	0.20	72.4
I2MA-0033 LANG SEN 1-2C-2	0.97	1.11	0.57	0.25	74.9	10	0.09	0.08	0.01	0.87	13.15	39.6	19	0.05	892
I2MA-0034 LANG SEN-3-4A	1.37	5.48	18.60	5.70	554	130	1.60	0.19	0.03	0.75	33.5	115.5	56	0.58	2370
I2MA-0035 LANG SEN-3-4B	0.77	0.01	0.37	0.69	24.1	10	0.27	<0.01	<0.01	0.14	0.93	4.2	29	0.24	402
I2MA-0036 LANG SEN-3-4C	1.02	<0.01	0.43	9.66	46.8	110	2.52	0.02	0.02	0.43	89.3	47.5	51	1.26	182.5
I2MA-0037 LANG SEN-3-4D	0.69	0.04	11.35	0.32	71.0	10	0.18	0.03	<0.01	0.11	1.41	2.9	29	0.07	165.0
I2MA-0038 LIEN SON-2-2	0.71	68.9	0.82	3.70	12.8	250	0.88	0.23	0.04	0.04	46.2	7.5	87	2.49	56.7

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 24-FEB-2014
Account: MASSOC

CERTIFICATE OF ANALYSIS RE14018921

Sample Description	Method / Analyte / Units / LOR	ME-MS61 Fe % 0.01	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	Hg-MS42 Hg ppm 0.005	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2
I2MA-0001 CAO RAM-Trench		8.35	16.75	0.18	1.2	0.178	0.539	1.19	23.0	14.2	1.39	1800	8.37	0.45	15.3	45.8
I2MA-0002 CAO RAM-Trench		8.27	15.85	0.18	1.1	0.182	0.499	1.15	21.3	13.3	1.37	1780	7.54	0.44	13.8	42.4
I2MA-0003 CAO RAM-Pond		10.55	14.80	0.22	0.9	0.346	0.682	1.04	22.6	11.2	1.08	1740	15.15	0.35	11.3	51.7
I2MA-0004 CAO RAM-Pond		10.70	15.45	0.25	0.9	0.342	0.638	1.06	24.5	11.8	1.10	1660	15.90	0.35	11.4	53.9
I2MA-0005 CAO RAM-Creek		8.57	14.45	0.19	1.0	0.158	0.451	1.04	19.9	11.9	1.23	1660	8.49	0.41	12.4	46.3
I2MA-0006 CAO RAM-Creek		8.78	15.45	0.21	1.0	0.177	0.486	1.05	21.8	13.1	1.22	1720	9.43	0.41	12.8	50.4
I2MA-0007 HOP HOA-1		3.31	4.46	0.09	1.3	0.126	0.008	0.07	16.3	10.6	0.02	75	25.1	0.02	13.9	3.1
I2MA-0008 HOP HOA-2A		20.1	34.5	0.59	4.2	0.027	0.087	3.39	94.2	9.1	0.14	488	12.80	0.08	24.0	50.1
I2MA-0009 HOP HOA-2B		17.30	30.5	0.54	3.4	0.041	0.064	2.87	82.9	6.1	0.11	991	8.80	0.06	19.0	42.6
I2MA-0010 HOP HOA-2C		6.44	33.1	0.19	0.3	0.011	0.044	0.19	17.8	6.9	0.08	546	0.55	<0.01	1.0	20.7
I2MA-0011 HOP HOA-3		8.27	28.4	0.20	0.9	0.008	0.107	0.07	12.1	5.5	0.07	1370	0.51	0.01	7.6	15.1
I2MA-0012 HOP HOA-4		10.60	27.2	0.26	3.2	0.013	0.123	0.08	34.9	19.6	1.45	2480	1.06	0.03	25.9	103.0
I2MA-0013 VAI DAO-1		6.47	1.25	0.15	<0.1	0.240	0.023	0.04	0.7	5.0	0.25	305	3.11	<0.01	0.5	24.6
I2MA-0014 VAI DAO-2		21.9	4.96	0.39	0.1	0.029	0.097	0.31	3.7	2.0	0.49	858	1.11	0.10	2.4	127.5
I2MA-0015 VAI DAO-3		8.83	21.6	0.28	0.6	0.010	0.186	0.99	15.3	11.1	2.04	2420	1.02	0.66	9.7	37.7
I2MA-0016 VAI DAO-4		11.35	0.87	0.25	<0.1	0.558	0.042	0.02	<0.5	7.0	0.27	351	4.56	0.01	0.3	43.4
I2MA-0017 VAI DAO-5A		8.68	19.60	0.25	0.5	0.038	0.196	2.64	22.7	5.9	2.55	1870	3.77	0.04	15.7	42.6
I2MA-0018 VAI DAO-5B		2.26	0.57	0.10	<0.1	0.033	0.029	0.03	<0.5	1.8	0.15	298	2.07	<0.01	0.2	12.0
I2MA-0019 LANG SEN-2-3A		9.71	0.28	0.20	<0.1	<0.005	0.095	0.01	<0.5	0.9	0.01	35	0.91	<0.01	0.2	1.2
I2MA-0020 LANG SEN-2-3B		11.80	0.33	0.26	<0.1	0.042	0.087	<0.01	0.7	1.0	<0.01	79	1.90	<0.01	0.3	6.5
I2MA-0021 LANG SEN-2-3B-1		36.9	0.26	0.51	<0.1	<0.005	0.008	<0.01	8.1	0.5	0.01	76	0.89	<0.01	0.5	41.1
I2MA-0022 LANG SEN-2-3B-2		16.85	41.3	0.40	0.6	0.005	0.242	3.31	34.9	24.1	0.61	277	3.42	0.03	10.8	29.4
I2MA-0023 LANG SEN-2-3B-3		9.93	8.03	0.22	0.5	<0.005	0.029	0.21	5.5	5.2	0.16	400	1.57	<0.01	5.1	19.9
I2MA-0024 LANG SEN-2-3B-4		22.7	0.59	0.45	<0.1	0.055	0.028	0.02	5.0	1.2	0.01	62	8.41	<0.01	0.6	36.9
I2MA-0025 LANG SEN-2-3B-5		5.04	1.28	0.16	0.1	0.044	0.012	0.02	0.9	2.2	0.02	123	2.84	0.01	0.5	7.0
I2MA-0026 LANG SEN-2-3B-3																
I2MA-0027 LANG SEN-1-1		24.5	7.44	0.55	0.1	0.036	0.078	0.45	12.9	2.7	0.05	213	3.09	0.01	3.3	6.0
I2MA-0028 LANG SEN 1-2-A		37.8	0.18	0.63	<0.1	0.009	0.013	<0.01	1.5	0.3	<0.01	24	1.67	<0.01	0.6	169.0
I2MA-0029 LANG SEN 1-2A-2		1.43	0.15	0.10	<0.1	0.005	<0.005	0.01	<0.5	0.5	<0.01	82	1.59	<0.01	0.1	3.6
I2MA-0030 LANG SEN 1-2B-1		18.65	0.45	0.36	<0.1	0.009	0.012	<0.01	6.9	0.5	<0.01	69	4.30	<0.01	0.3	19.4
I2MA-0031 LANG SEN 1-2B-2		10.05	0.52	0.20	<0.1	0.008	0.005	<0.01	<0.5	0.5	<0.01	70	4.56	<0.01	0.4	2.8
I2MA-0032 LANG SEN 1-2C-1		6.17	2.88	0.15	0.1	0.114	0.031	0.21	1.6	2.1	0.12	287	3.43	<0.01	1.1	35.6
I2MA-0033 LANG SEN 1-2C-2		18.55	0.78	0.37	0.1	0.068	0.064	0.03	7.4	1.3	0.02	138	3.27	<0.01	0.8	18.8
I2MA-0034 LANG SEN-3-4A		21.9	18.95	0.54	1.0	1.080	1.960	0.21	25.0	27.3	1.05	690	1.43	0.10	11.5	59.9
I2MA-0035 LANG SEN-3-4B		2.93	3.46	0.12	<0.1	0.077	0.080	0.01	1.0	8.0	0.19	250	1.07	<0.01	0.3	9.1
I2MA-0036 LANG SEN-3-4C		14.30	33.6	0.39	1.6	0.082	0.144	0.03	49.8	66.7	0.78	2480	0.37	0.01	29.3	119.5
I2MA-0037 LANG SEN-3-4D		2.40	1.44	0.09	<0.1	2.28	0.740	0.01	1.5	2.5	0.09	128	1.30	0.01	0.3	5.3
I2MA-0038 LIEN SON-2-2		4.48	11.25	0.12	1.7	0.087	0.107	0.90	32.1	10.5	0.20	102	5.34	0.02	7.9	36.9

***** See Appendix Page for comments regarding this certificate *****

ALS USA Inc.
4977 Energy Way
Reno NV 89502
Phone: 775 356 5395 Fax: 775 355 0179 www.alsglobal.com

To: I2M ASSOCIATES, LLC
1810 ELMEN STREET
HOUSTON TX 77019

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Total # Pages: 2 (A - D)
Plus Appendix Pages
Finalized Date: 24-FEB-2014
Account: MASSOC

CERTIFICATE OF ANALYSIS RE14018921

Sample Description	Method / Analyte / Units / LOR	ME-MS61 P ppm 10	ME-MS61 Pb ppm 0.5	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.2	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02
I2MA-0001 CAO RAM-Trench		1670	47.0	60.7	0.002	0.29	37.7	18.7	1	7.7	182.5	0.99	0.11	2.5	0.857	0.36
I2MA-0002 CAO RAM-Trench		1660	41.9	56.9	0.002	0.27	36.1	18.0	2	7.0	175.5	0.89	0.10	2.3	0.853	0.35
I2MA-0003 CAO RAM-Pond		1720	42.7	51.2	0.004	0.28	74.5	18.3	1	4.0	157.5	0.72	0.20	2.2	0.664	0.38
I2MA-0004 CAO RAM-Pond		1770	45.8	53.8	0.004	0.30	77.6	19.2	2	3.8	163.0	0.72	0.18	2.3	0.653	0.38
I2MA-0005 CAO RAM-Creek		1580	30.9	49.6	0.002	0.17	42.5	18.5	2	5.5	162.5	0.79	0.09	2.0	0.837	0.29
I2MA-0006 CAO RAM-Creek		1580	33.5	52.9	0.003	0.18	48.0	19.8	1	5.2	168.0	0.81	0.11	2.2	0.783	0.32
I2MA-0007 HOP HOA-1		110	3.4	4.2	<0.002	1.88	8.79	0.5	1	0.5	59.6	0.84	<0.05	2.0	0.048	0.21
I2MA-0008 HOP HOA-2A		2060	1.8	136.0	<0.002	0.02	25.4	17.5	1	2.3	12.0	1.47	0.17	13.1	0.393	0.39
I2MA-0009 HOP HOA-2B		1750	1.6	117.5	<0.002	0.01	26.1	13.2	1	1.8	7.2	1.15	0.23	10.8	0.309	0.35
I2MA-0010 HOP HOA-2C		480	10.7	15.7	<0.002	0.02	25.0	5.3	<1	0.6	192.5	0.06	<0.05	0.2	0.091	0.05
I2MA-0011 HOP HOA-3		550	38.9	2.9	0.007	0.01	3.95	10.0	1	0.8	1485	0.46	<0.05	0.8	0.560	0.02
I2MA-0012 HOP HOA-4		1130	25.7	4.7	<0.002	0.02	0.71	29.9	3	1.4	737	1.62	0.05	2.7	1.895	0.02
I2MA-0013 VAI DAO-1		40	32.1	2.0	<0.002	5.12	13.35	0.7	2	0.3	24.4	<0.05	2.50	<0.2	0.030	0.31
I2MA-0014 VAI DAO-2		390	4.5	17.3	<0.002	>10.0	14.65	4.5	1	2.5	36.4	0.13	0.12	0.4	0.167	0.99
I2MA-0015 VAI DAO-3		1630	29.3	59.1	<0.002	3.74	16.80	17.8	1	18.8	106.5	0.63	<0.05	1.4	0.791	0.28
I2MA-0016 VAI DAO-4		20	56.4	1.1	<0.002	8.89	23.0	0.5	2	0.2	18.1	<0.05	2.65	<0.2	0.007	2.29
I2MA-0017 VAI DAO-5A		2270	8.1	132.0	<0.002	0.43	8.82	22.8	2	2.3	255	0.97	0.05	1.8	1.240	0.41
I2MA-0018 VAI DAO-5B		30	5.7	1.3	<0.002	1.29	20.4	0.7	1	0.3	10.4	<0.05	0.25	<0.2	0.012	0.12
I2MA-0019 LANG SEN-2-3A		610	58.8	3.2	<0.002	0.04	281	0.1	1	<0.2	7.5	<0.05	1.56	<0.2	<0.005	0.03
I2MA-0020 LANG SEN-2-3B		20	86.1	0.2	<0.002	7.25	514	0.2	11	<0.2	1.3	<0.05	3.99	<0.2	0.005	0.02
I2MA-0021 LANG SEN-2-3B-1		10	18.9	0.1	<0.002	>10.0	2.89	0.1	4	<0.2	5.0	<0.05	0.20	<0.2	<0.005	<0.02
I2MA-0022 LANG SEN-2-3B-2		2500	6.6	148.0	<0.002	1.27	7.12	34.6	2	15.9	25.1	0.58	0.11	2.9	0.686	0.48
I2MA-0023 LANG SEN-2-3B-3		700	5.7	19.5	<0.002	3.51	4.09	6.9	1	1.0	54.0	0.31	0.10	0.6	0.442	0.08
I2MA-0024 LANG SEN-2-3B-4		500	42.3	0.7	<0.002	>10.0	8.25	1.4	6	0.2	2.8	<0.05	0.15	<0.2	0.016	0.03
I2MA-0025 LANG SEN-2-3B-5		120	3.3	1.3	<0.002	2.11	41.6	0.9	1	<0.2	7.5	<0.05	0.15	<0.2	0.039	0.11
I2MA-0026 LANG SEN-2-3B-3																
I2MA-0027 LANG SEN-1-1		1950	63.8	20.4	<0.002	1.86	201	6.8	4	3.2	6.1	0.14	5.70	1.0	0.152	0.32
I2MA-0028 LANG SEN 1-2-A		30	293	0.2	<0.002	>10.0	1.44	0.1	18	<0.2	0.9	<0.05	0.29	<0.2	<0.005	15.20
I2MA-0029 LANG SEN 1-2A-2		30	2.0	0.2	<0.002	0.25	2.80	0.1	1	<0.2	0.5	<0.05	<0.05	<0.2	<0.005	0.07
I2MA-0030 LANG SEN 1-2B-1		60	13.3	0.1	<0.002	>10.0	14.20	0.1	3	<0.2	0.6	<0.05	0.42	<0.2	<0.005	0.24
I2MA-0031 LANG SEN 1-2B-2		370	1.3	0.1	<0.002	0.49	3.39	0.3	1	0.2	1.6	<0.05	0.06	<0.2	0.022	0.04
I2MA-0032 LANG SEN 1-2C-1		260	15.1	10.3	<0.002	3.24	14.45	1.4	1	2.4	21.0	0.06	1.19	0.2	0.077	0.14
I2MA-0033 LANG SEN 1-2C-2		80	26.4	1.2	<0.002	>10.0	2.98	0.7	5	0.5	64.4	<0.05	0.10	<0.2	0.036	<0.02
I2MA-0034 LANG SEN-3-4A		1760	54.0	8.9	<0.002	2.71	5.02	23.1	6	1.7	14.0	0.73	0.31	1.8	0.954	0.05
I2MA-0035 LANG SEN-3-4B		210	0.7	0.9	<0.002	0.05	1.21	1.9	1	<0.2	2.7	<0.05	<0.05	<0.2	0.020	<0.02
I2MA-0036 LANG SEN-3-4C		1660	22.2	12.8	<0.002	0.05	3.68	36.2	4	2.1	25.8	2.03	0.08	3.8	2.51	0.06
I2MA-0037 LANG SEN-3-4D		130	15.5	0.4	<0.002	0.02	3.45	1.4	1	0.3	1.6	<0.05	0.42	<0.2	0.018	<0.02
I2MA-0038 LIEN SON-2-2		520	18.1	45.0	0.002	0.02	5.76	18.1	<1	1.4	165.0	0.51	0.10	5.3	0.202	0.23

***** See Appendix Page for comments regarding this certificate *****

ALS USA Inc.
4977 Energy Way
Reno NV 89502
Phone: 775 356 5395 Fax: 775 355 0179 www.alsglobal.com

To: I2M ASSOCIATES, LLC
1810 ELMEN STREET
HOUSTON TX 77019

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Total # Pages: 2 (A - D)
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Finalized Date: 24-FEB-2014
Account: MASSOC

CERTIFICATE OF ANALYSIS RE14018921

Sample Description	Method / Analyte / Units / LOR	ME-MS61 U ppm 0.1	ME-MS61 V ppm 1	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5
I2MA-0001 CAO RAM-Trench		2.8	200	4.2	18.3	165	44.5
I2MA-0002 CAO RAM-Trench		2.5	199	3.9	17.2	159	39.1
I2MA-0003 CAO RAM-Pond		4.3	192	3.6	17.6	187	35.4
I2MA-0004 CAO RAM-Pond		4.6	198	3.6	18.4	188	36.6
I2MA-0005 CAO RAM-Creek		2.5	194	3.8	16.3	148	34.9
I2MA-0006 CAO RAM-Creek		2.8	195	3.9	17.6	148	37.6
I2MA-0007 HOP HOA-1		0.4	2	0.8	5.2	5	42.8
I2MA-0008 HOP HOA-2A		1.8	157	0.5	24.1	137	202
I2MA-0009 HOP HOA-2B		1.4	131	0.4	18.2	112	164.5
I2MA-0010 HOP HOA-2C		0.3	397	0.1	9.8	31	12.3
I2MA-0011 HOP HOA-3		0.5	331	0.1	10.1	36	28.8
I2MA-0012 HOP HOA-4		1.1	313	0.2	29.8	172	111.5
I2MA-0013 VAI DAO-1		0.3	10	0.2	1.0	97	1.8
I2MA-0014 VAI DAO-2		0.1	46	2.3	5.1	14	5.2
I2MA-0015 VAI DAO-3		0.2	185	9.6	15.5	48	17.6
I2MA-0016 VAI DAO-4		0.3	9	0.1	0.8	82	0.7
I2MA-0017 VAI DAO-5A		0.4	262	2.5	18.0	103	19.3
I2MA-0018 VAI DAO-5B		<0.1	3	0.2	1.1	12	0.7
I2MA-0019 LANG SEN-2-3A		<0.1	19	<0.1	0.2	171	<0.5
I2MA-0020 LANG SEN-2-3B		<0.1	1	0.1	0.1	10	<0.5
I2MA-0021 LANG SEN-2-3B-1		<0.1	2	<0.1	0.4	<2	<0.5
I2MA-0022 LANG SEN-2-3B-2		0.3	387	6.5	23.6	102	23.1
I2MA-0023 LANG SEN-2-3B-3		0.2	108	0.6	5.1	34	21.3
I2MA-0024 LANG SEN-2-3B-4		<0.1	7	0.1	2.0	6	0.9
I2MA-0025 LANG SEN-2-3B-5		<0.1	12	0.1	0.9	6	2.3
I2MA-0026 LANG SEN-2-3B-3							
I2MA-0027 LANG SEN-1-1		0.1	210	1.4	3.5	30	4.2
I2MA-0028 LANG SEN 1-2-A		<0.1	3	0.1	0.2	<2	<0.5
I2MA-0029 LANG SEN 1-2A-2		<0.1	2	<0.1	0.1	<2	0.6
I2MA-0030 LANG SEN 1-2B-1		<0.1	2	0.1	0.4	<2	<0.5
I2MA-0031 LANG SEN 1-2B-2		<0.1	29	0.4	0.4	9	1.1
I2MA-0032 LANG SEN 1-2C-1		0.1	23	1.3	1.3	24	2.4
I2MA-0033 LANG SEN 1-2C-2		<0.1	9	0.2	1.1	111	1.8
I2MA-0034 LANG SEN-3-4A		0.4	278	0.7	21.3	1120	41.4
I2MA-0035 LANG SEN-3-4B		<0.1	63	0.1	2.8	313	0.9
I2MA-0036 LANG SEN-3-4C		0.6	453	0.5	66.4	350	57.4
I2MA-0037 LANG SEN-3-4D		<0.1	26	0.1	1.7	163	1.0
I2MA-0038 LIEN SON-2-2		2.4	153	1.0	13.5	36	70.7

***** See Appendix Page for comments regarding this certificate *****

ALS USA Inc.
4977 Energy Way
Reno NV 89502
Phone: 775 356 5395 Fax: 775 355 0179 www.alsglobal.com

To: I2M ASSOCIATES, LLC
1810 ELMEN STREET
HOUSTON TX 77019

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Finalized Date: 24-FEB-2014
Account: MASSOC

CERTIFICATE OF ANALYSIS RE14018921

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

REE's may not be totally soluble in this method.

Applies to Method: ME-MS61

LABORATORY ADDRESSES

Processed at ALS Reno located at 4977 Energy Way, Reno, NV, USA.

Applies to Method:

Au-AA25	BAG-01	CRU-21	CRU-31
CRU-QC	LOG-22	PUL-32	PUL-QC
SPL-21	WEI-21		

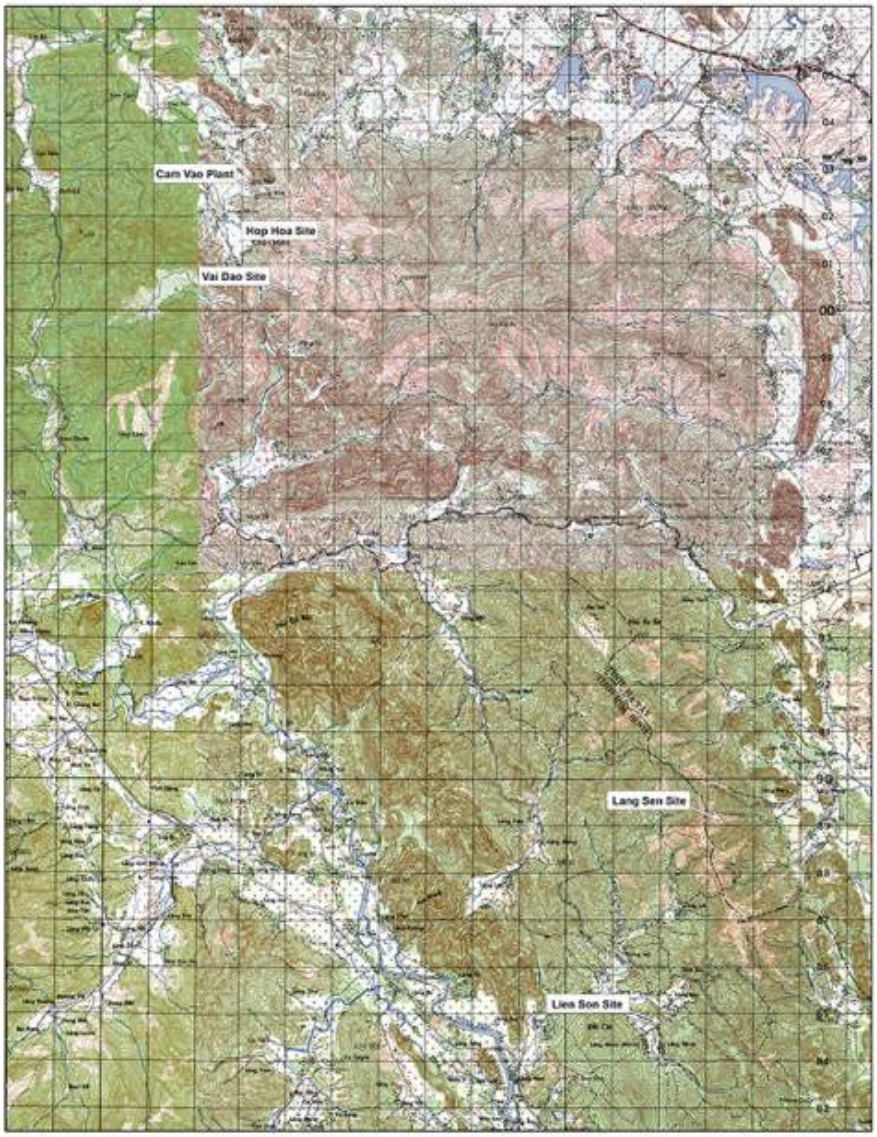
Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method: Hg-MS42 ME-MS61

Appendix V

Topographic Maps of Areas of Interest

Regional Topographic Map



PROJECT TOPOGRAPHIC MAP
Vietnam Project 7244

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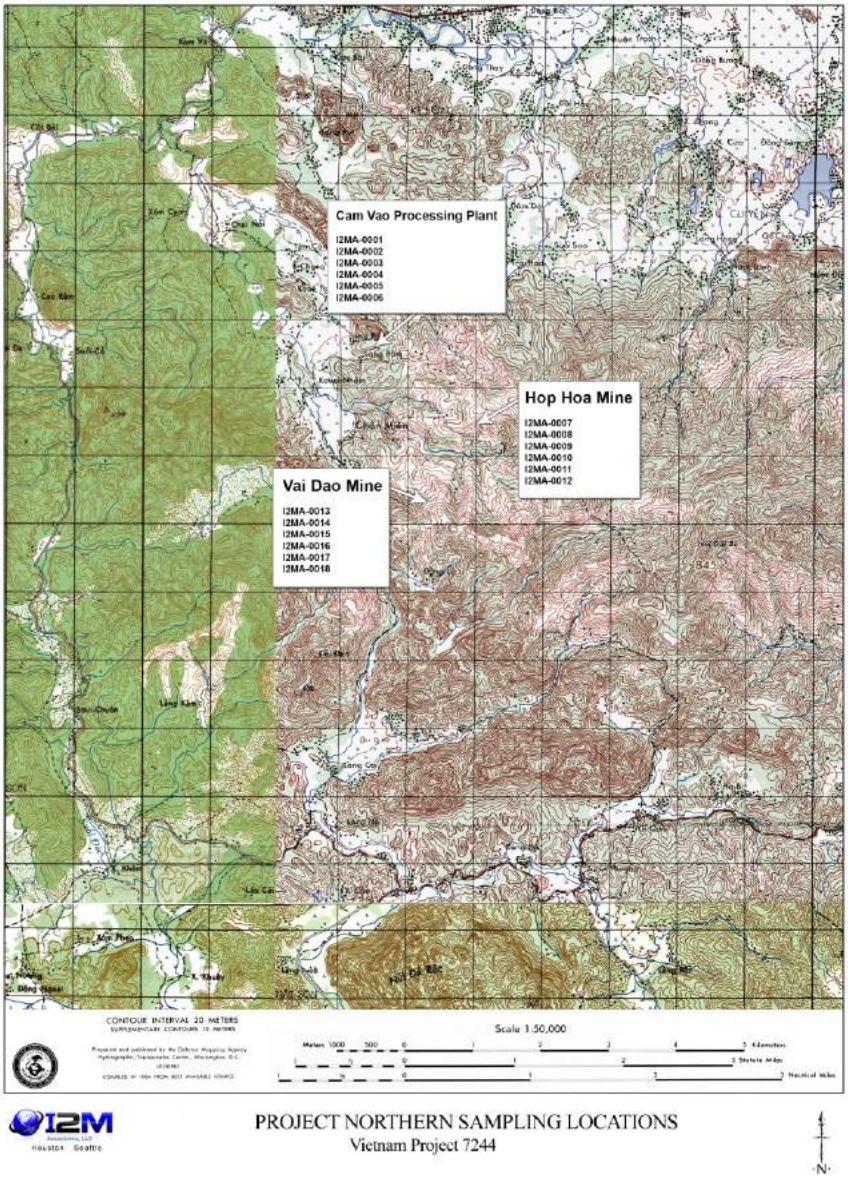
Northern Sampling Areas



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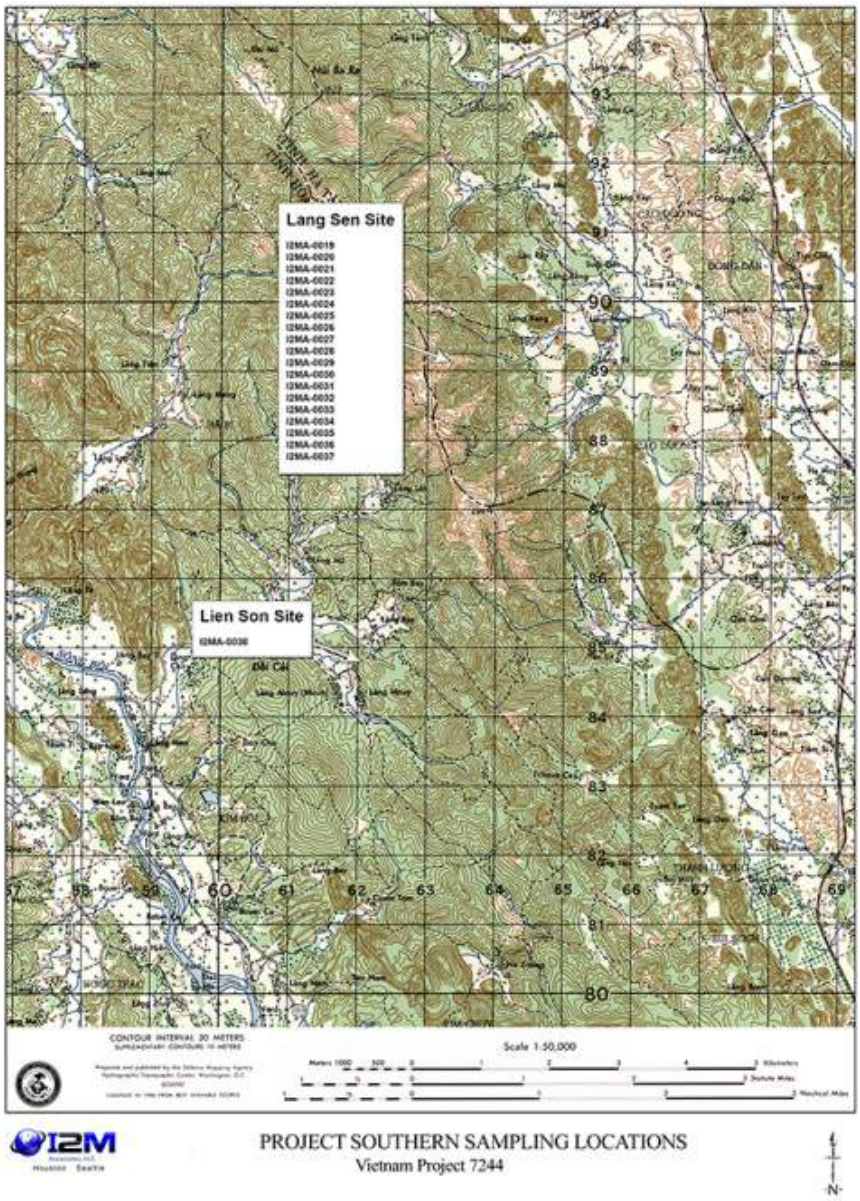
Southern Sampling Areas



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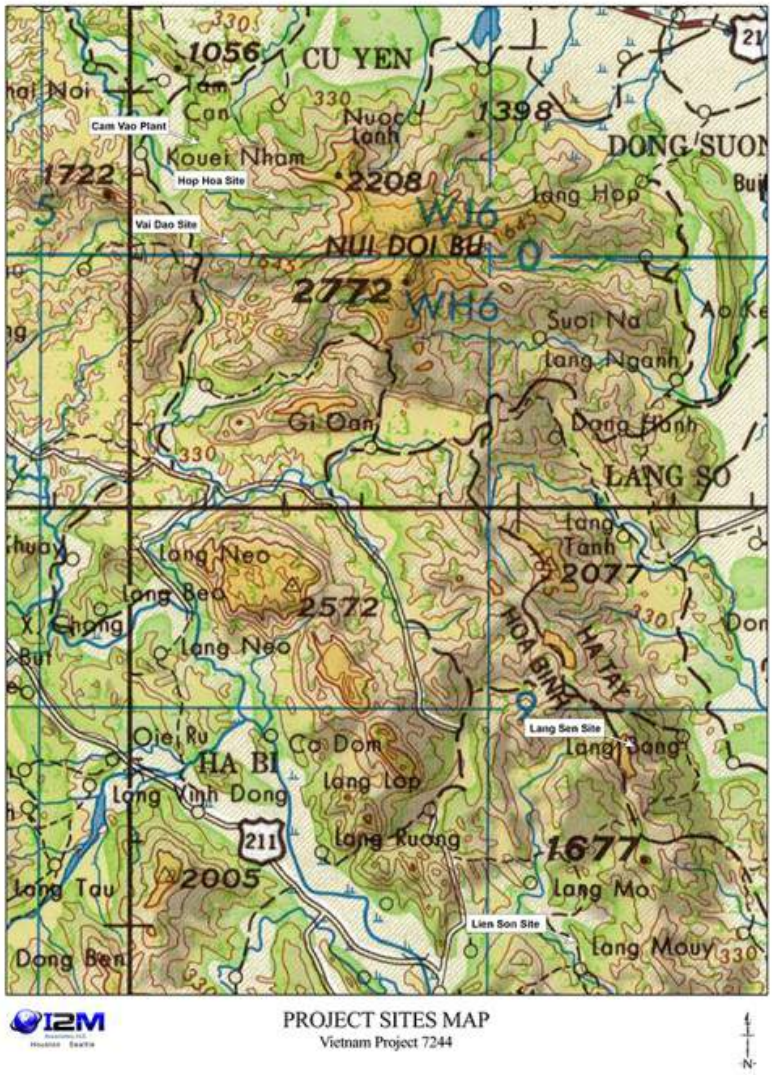
Old Topographic Map with Village Names



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