

Keumdongchilbo-Goroseoksan Cu-Au-Ag-Pb-Zn prospect

Technical Summary

The historical Keumdongchilbo, Goroseoksan and Daedonga Cu-Au-Ag-Pb-Zn mines lie within the Uiseong mining district, located about 3km W of the township of Sachon. Keumdongchilbo is accessed from the north from the village of Geumo-ri. Goroseoksan and Daedonga are accessible by paved road from the south, via the small villages of Goro-ri and Seoksan-ri.

KeumdongChilbo lies between elevations of 300-400masl. Situated 2000m south of Keumdongchilbo, the Goroseoksan (aka Keumdongdo) Pb-Zn-Ag mine lies at elevations of 500-702masl near the peak of Goroseoksan, (727.7masl). The Daedonga mine was situated 1.7 km SW of Keumdongchilbo.

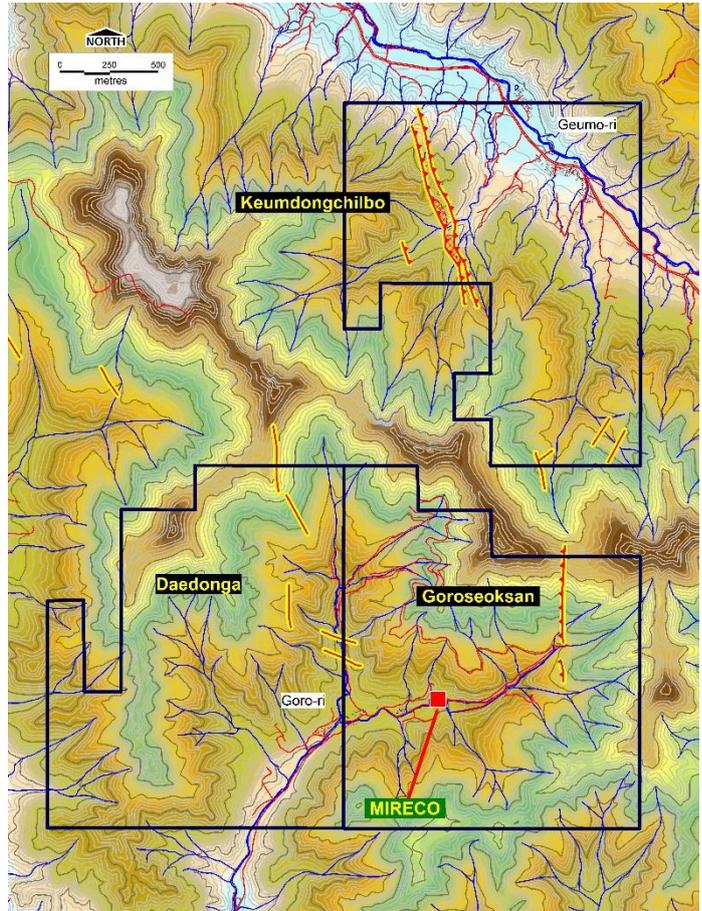
Historical Mining Operation

The historical Goroseoksan (aka Keumdongdo) Ag-Pb-Zn mine was the main mining operation. At least 3 adit levels are evident at the Goroseoksan Pb-Zn-Ag mine, but no production details are recorded. Typical mine ore grades were 2-12% Pb and 1-6% Zn (Se Woo, 2008).

Workings at KeumdongChilbo consisted of 2 prospecting adits, but had little or no production.

A mobile flotation mill was erected at the Daedonga mine, which used selective flotation methods (Kim, 1964) to recover lead and zinc concentrates. The lead concentrate graded 65-67% Pb, with a recovery of 94-95%, together with most of the silver and copper. The zinc concentrate graded 51-53% Zn with a recovery of 88%. Gold was recovered from the tailings by gravity concentration.

The mining operation was large enough to support a school at Goro-ri with 9,000 pupils. The mines closed in 1972.



Digital Topographic Map of the Keumdongchilbo, Daedonga and Goroseoksan Mines, with the major vein structures highlighted. The MIRECO mine run-off water treatment facility is also indicated.



Panoramic view looking southwest towards the KeumdongChilbo prospect area. Access is via a farm track from nearby Geumo-ri village. The No 1 Adit is located in the gully-creek area at far left (see red arrow).

Stream Sediment Geochemistry

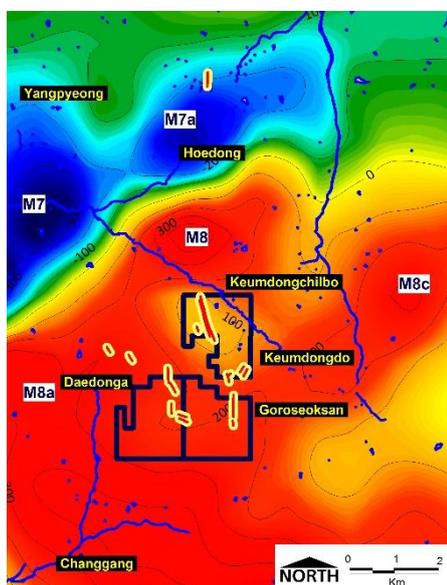
The *Korea Institute of Geoscience and Mineral Resources* (KIGAMM, 2001) conducted a country-wide stream sediment geochemical survey in 1971 (Sample density of 1 per 3.5km²). The active fine sand fraction was sieved to -100# (-150µm) and 70-100g collected from each site. Stream sediment geochemistry indicates the creeks draining the Keumdongchilbo, Goroseoksan and Daedonga workings are anomalous in Pb, Zn, Co, Mn, Ba and V, centred on Goroseoksan.

Geophysics

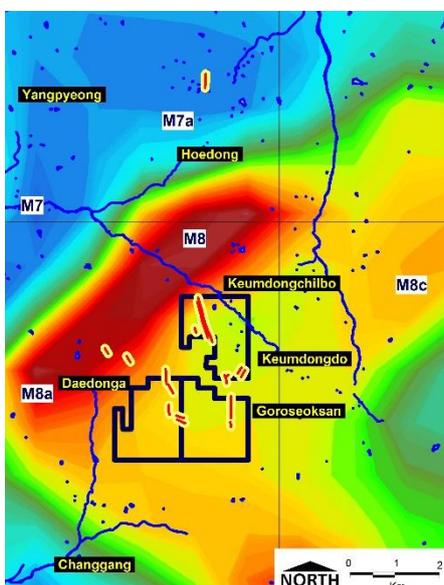
Regional airborne geophysical surveys were flown on east-west lines (1.5km spacing) during 1989-1991 by the *Korean Institute of Geology Mining & Materials* (KIGAM, 2002), at a terrain clearance altitude of 120m.

Anomalies **M7** and **M7a** is a broad deep magnetic low, situated north of Keumdongchilbo, that corresponds well with the purple mudstone sequence of the Chunsan Formation. Anomalies **M8** and **M8a** is a prominent NE-SW striking magnetic anomaly, located between the Daedonga and Hoedong mines and corresponds well with mapped gabbro-diorite. Keumdongchilbo sits within a magnetic low and could indicate magnetite destructive alteration. The Sachon diatreme complex, east of Goroseoksan is coincidental with magnetic low and gravity low anomalies.

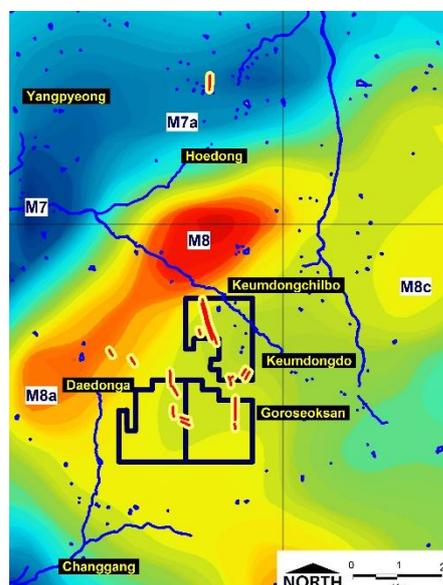
Anomaly **G8** is a 12mgal gravity anomaly immediately west of the Goroseoksan mine, corresponding to gabbro/basalt.



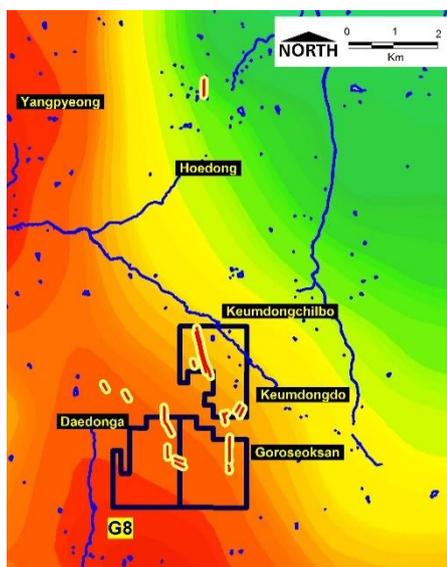
Magnetic Anomaly Map



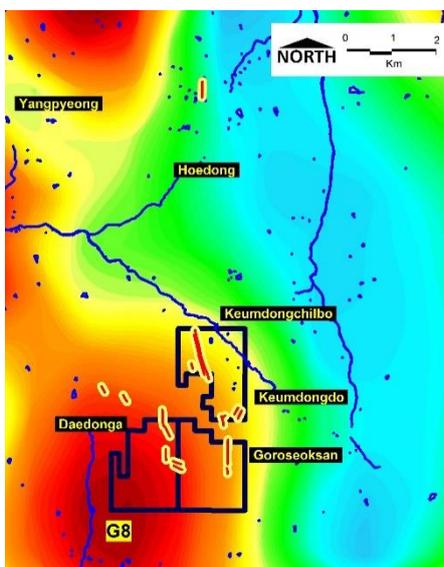
Magnetics- Total Field Map



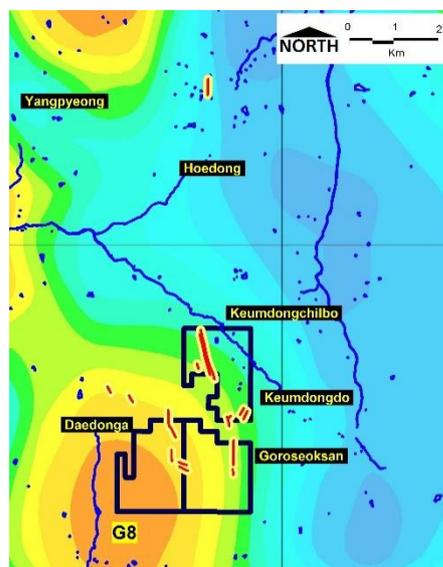
Magnetics - Reduced To Pole



Bouguer Gravity Anomaly Map



Gravity - 1st Vertical Derivative



Gravity - 2nd Vertical Derivative

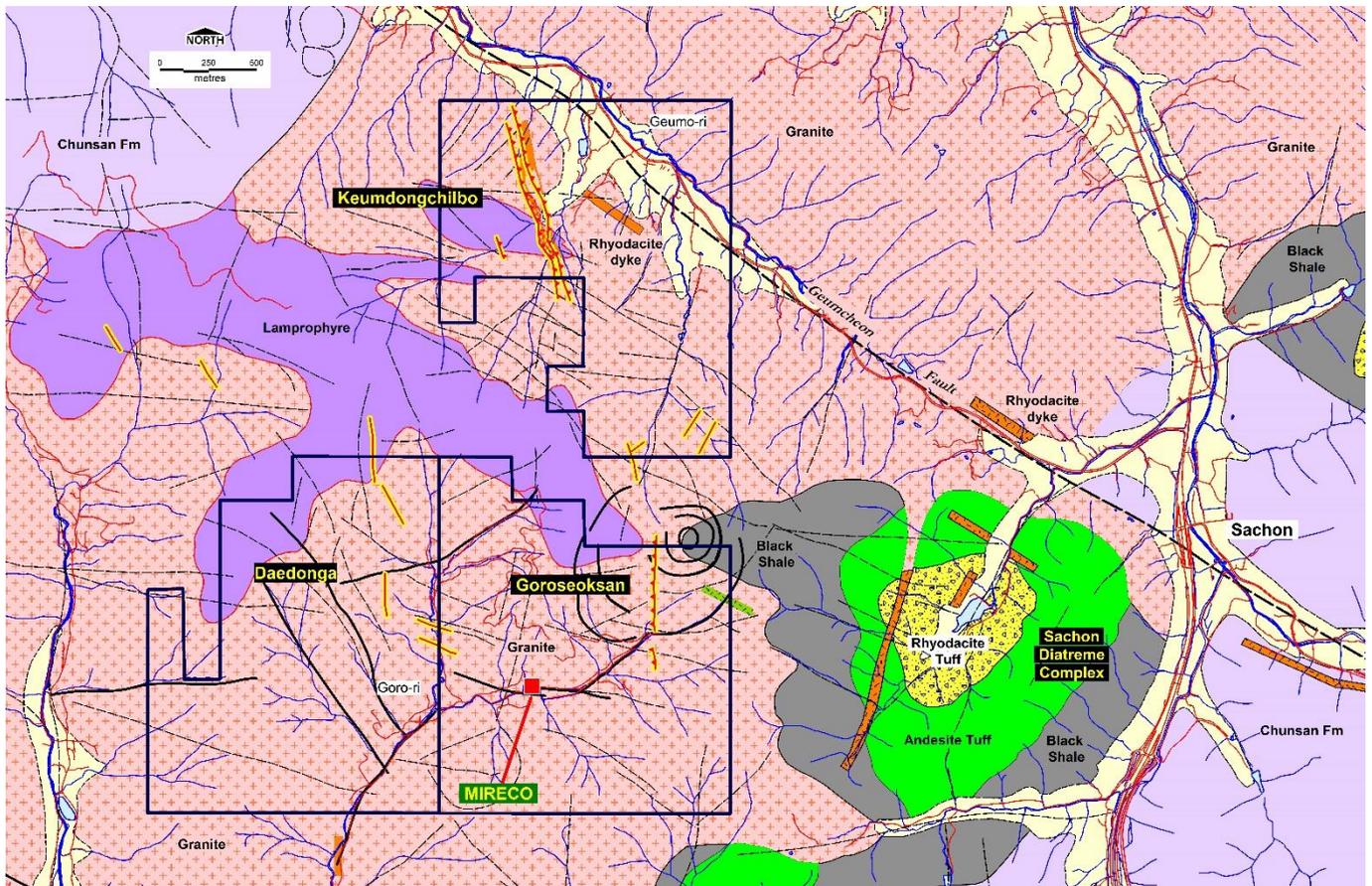
Geology

The Goroseoksan, Keumdongchilbo and Daedonga workings are hosted within the Cheongseong Granite, a large, elongate monzonite granite intrusion crudely orientated NE-SW. The monzonite is composed of porphyritic quartz and K-feldspar grains, plagioclase, microcline, biotite, hornblende and minor amounts of sphene, muscovite, apatite and zircon. The granite displays a seriate, granular porphyritic texture with miarolitic cavities (Choi et al, 1992). Porphyritic K-feldspar crystals are typically enclosed by reaction rims of plagioclase and the porphyritic quartz grains are highly corroded, suggesting partial dissolution of earlier-formed phenocrysts occurred (Yang and Bodnar, 1994). The rock exhibits zircon fractionation, indicating it may have been derived from a gabbroic lower crust (Lee, 1997). Kim et al (2005) and Hwang (2010) suggest both granitic and mafic enclaves crystallized contemporaneously as a result of injection of mafic melt into a felsic magma chamber. A typical sample of the monzonite assayed 3g/t Ag, 660ppm Ba, 409ppm Pb, 435ppm Zn, and 18ppm Sb. Age dating by Kim et al (1997) obtained ages of 63.6 ± 1.5 Ma to 65.8 ± 5.8 Ma for the early biotite granodiorite phase.

The small *Sachon* maar-diatreme complex is located about 1.5km E east of Goroseoksan. The diatreme is ovoid-shaped, approximately 650m in diameter, hosted within the monzonite granite, immediately adjacent to the contact with the Chunsan Formation. The diatreme includes basal black shale "moat" sediments of the Shinyangdong Formation, overlain by andesite tuff (Jusasan Andesite) and a core extrusion of rhyolite tuff breccia (Unmunsa Rhyolite). The rhyodacite dykes appear to emanate from this diatreme. The major NW striking Geumcheon Fault passes immediately north of Keumdongchilbo. This fault shows sinistral transfer fault displacements of the monzonite granite and appears to have controlled the emplacement of the Sachon diatreme complex.

Quartz-carbonate vein-greisen shears and tourmaline intrusion breccias, accompanied by polymetallic mineralization, are developed within the monzonite granite at Keumdongchilbo and Goroseoksan. The granite has also been intruded by NW and NNE striking aplite, felsite and quartz porphyry dykes which are probably related to the mineralization.

Several mafic intrusions are mapped in the area at Sunamsan, Bongrimisan and Ebongsan, NW of Keumdongchilbo. The gabbro at Ebongsan displays a prominent NE-SW orientated magnetic high, coincidental with gravity high, and may indicate a later more mafic differentiated phase of the larger intrusion. Age dating by Kim et al (1997) obtained 45.1 ± 2.3 Ma to 51.6 ± 2.8 Ma ages for the gabbro at Bongrimisan. These dates are post-mineralization in age.



Regional Geology of the Keumdongchilbo prospect & Goroseoksan mine.

Igneous Rocks



Hornblende-plagioclase monzonite granite, with twinned plagioclase, mafic xenoliths and miarolitic cavities, Goroseoksan, Sample 155536: 740ppm Ba.



Chlorite-biotite-actinolite altered monzonite with miarolitic cavities, Keumdongchilbo, 242726: 18ppm Sb, 409ppm Pb, 660ppm Ba.



Monzonite porphyry with miarolitic cavities and twinned porphyritic plagioclase grains, Goroseoksan. Sample 155537: 520ppm Ba, 119ppm V.



Magmatic tourmaline intrusion breccia, with mineralized milled-corroded monzogranite clasts in a tourmaline matrix, Goroseoksan. Sample 155506: 558ppm Pb, 606ppm Zn, 122ppm As.

Mineralization

At the Keumdongchilbo prospect, at least 3 subparallel, NNW striking quartz-carbonate vein-breccias and shears are hosted within argillic clay altered rhyodacite-quartz porphyry and silica-actinolite-sulphide altered monzonite granitoid. The larger veins (No 1 and No 2 Veins) occur on the margins of a NNW striking, 70m wide breccia zone which was traced over a strike length of 700m. Drilling suggests the breccia zone is probably associated with the emplacement of a large rhyodacite-quartz porphyry dyke system.

The No 1 and No 2 Veins within the breccia zone vary in width from 1.5-3.0m and dip steeply to the E. Drilling suggests the No 2 Vein has a shallower dip angle and appears to coalesce-merge with the No 1 Vein at depth.

Vein mineralization outcrops at elevations ranging from 320m up to 450m, indicating a minimum vertical extent of 130m. Drill intercepts of mineralization range from depths of 48m down to 190m (EOH depth of 200m).

Two prospecting adits were excavated by the *Korean Mining Promotion Corporation* ("KMPC") during the 1970's. The No 2 Adit was driven NNW along the No 1 Vein for 20m. The No 1 Adit was driven towards the SW, designed to intersect both veins.



The No 2 Adit was driven along the No 1 Vein for a distance of 20m.

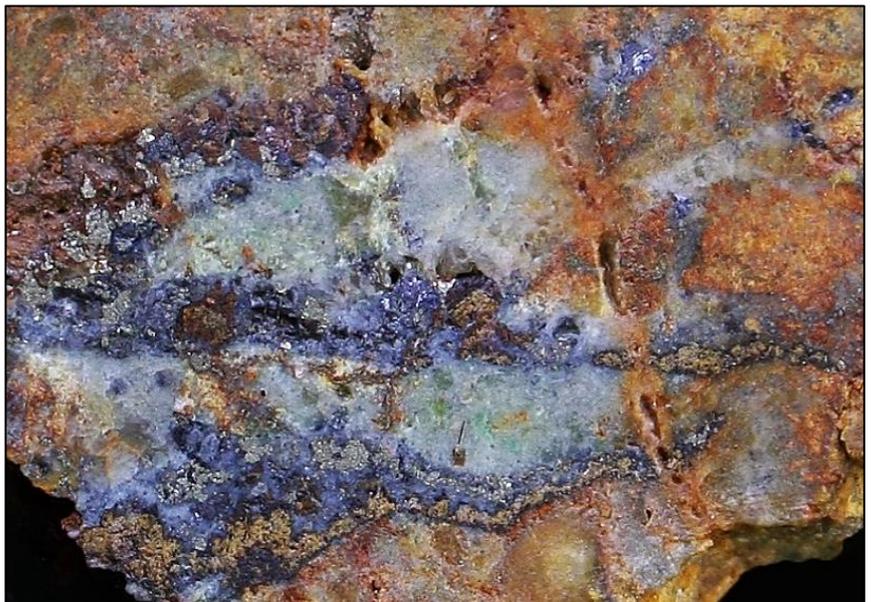
The Goroseoksan mine exploited a 2-6m wide breccia structure, which strikes north-south and dips steeply to the west. The breccia was traced over a strike length of 1200m. The Goroseoksan vein structure appears likely to be the southern "along strike" extension of the Keumdongchilbo Vein system and, if this concept is correct, indicates a potential combined strike length of 7,000m for the mineralized structure. Goroseoksan outcrops at much higher elevations (500-700masl) than Keumdongchilbo (300-400masl) and would imply the mineralized structure has a vertical extent of > 450m.

Mineralization at Goroseoksan (Keumdongdo) (Chi et al, 1991) consists of coarse-grained primary sulphides comprising chalcopyrite, galena, sphalerite (Fe-Cd), arsenopyrite and pyrite, electrum, native gold and silver, together with several antimony sulphosalts comprising Ag-tetrahedrite (CuAgZnSbS), pyrargyrite (AgSbS), polybasite (AgCuSbS), and bournonite (PbCuSbS). Secondary copper minerals cuprite and malachite were observed in the surface and weathered oxidized zone. Vein paragenesis indicates early deposition of grey chalcedony and cryptocrystalline quartz, then white quartz with arsenopyrite, early black-brown Fe/Cd-rich sphalerite, chalcopyrite and galena. Brecciation and opening of existing vein structures then occurred followed by deposition of late yellow Fe-poor sphalerite, electrum, and several antimony sulphosalts.

Fluid inclusion studies (Chi et al, 1991) indicate early high-temperature (250-350°C), moderate salinity (1-7 wt% NaCl; suggestive of distal magmatic source) hydrothermal fluids initially deposited quartz veining and disseminated Cu-Zn-Pb-Fe-As sulphides.

This stage was followed by boiling (carbonate replacement textures), an over-pressuring breccia event, followed by mixing, dilution and cooling with oxygenated meteoric waters, which deposited Au-Ag and Ag-Sb-Bi sulphosalts at lower temperatures (200-300°C).

Depth of formation was estimated to be 200-1,000m, indicative of an epithermal regime. Sulphur isotopes (3.7-7.1 $\delta^{34}\text{S}$) are consistent with an igneous source.



Silica-sericite-nontronite-clay altered volcaniclastic, with early grey fine-grained cryptocrystalline quartz, bands of sulphides and late "dog tooth" comb quartz crystals. Nontronite is the waxy pale green mineral. Sample No 242722; 0.47g/t Au, 40g/t Ag, 833ppm Cu, 1.44% Pb, 1.69% Zn, 0.53% As, 798ppm Sb, 106ppm Cd & 5.78% Fe.

Geochemistry

Rock chip sampling from Keumdongchilbo (2015) recorded significant results from the No 2 Adit dump (No 1 Vein), including 0.12-1.37g/t Au, 16-307g/t Ag, 0.06-0.24% Cu, 0.66-4.32% Pb, 0.36-9.66% Zn, confirming the reported KMPC historical sample grades of 2-12% Pb and 1-6% Zn (Se Woo, 2008) from the No 1 and No 2 Veins.

The mineralization is accompanied by highly anomalous molybdenum (13-131ppm Mo), antimony (0.17% Sb), arsenic (0.31-1.93% As), bismuth (16ppm Bi), cadmium (550ppm Cd), barium (900ppm Ba), and iron (3-8% Fe).

Rock chip samples from Goroseoksan recorded maximum assays of 2.93g/t Au, 159g/t Ag, 0.32% Cu, 3.87% Pb, 23.0% Zn from siliceous breccia with coarse-grained base metal sulphides, accompanied by highly anomalous critical metals, including indium (31ppm), bismuth (122ppm), molybdenum (43ppm) and antimony (0.40%) in particular.



Dump material extracted from the No 2 Adit, KeumdongChilbo prospect.



View looking north along the 3m wide slot excavated along the breccia vein structure at the Goroseoksan mine. A 4m wide, low-grade intense silica-sericite-sulphide alteration zone is developed in the unmined hangingwall at left.

Alteration

The brecciated, fractured rhyodacite/quartz porphyry intrusion exposed in the No 2 Adit portal at Keumdongchilbo is strongly kaolinite-argillic clay altered and hematite stained. This alteration is consistent with an argillic lithocap.

Within the monzonite, the feldspars exhibit an unusual pale orange-brown coloration which is tentatively interpreted as hematite “dusting” alteration, indicative of “calc-potassic” sodic alteration assemblage. Silica-actinolite alteration of mafics, accompanied by weak disseminated sulphides, is also observed and is consistent with “inner propylitic” style alteration assemblage.



Silica-actinolite-sulphide altered monzonite, with pale orange-brown hematite dusting of feldspars indicative of calc-potassic sodic alteration, KeumdongChilbo prospect. Sample No 242721b; 3g/t Ag, 660ppm Ba, 409ppm Pb, 435ppm Zn, & 18ppm Sb



Sheeted wispy “silica gris” veinlets in argillic clay altered monzonite granite, outcrop along forestry road at Goroseoksan.

Epithermal Vein Textures



Cut slab of quartz-carbonate vein and siliceous breccia from the KeumdongChilbo No 1 dump. Sample No 242724; 1.37g/t Au, 37.4g/t Ag, 648ppm Cu, 0.78% Pb, 4.99% Zn, 326ppm Sb, 131ppm Mo, 1.93% As & 8.00% Fe as pyrrhotite.



Early dark grey-brown Fe-rich sphalerite cut by later honey yellow Fe-poor sphalerite, Keumdongchilbo. Sample 242721: 0.60g/t Au, 94g/t Ag, 2.42% Pb, 1.66% Zn, 344ppm Cu, 0.39% As, 65ppm Bi, 152ppm Sb, 102ppm In, 0.11% Cd.

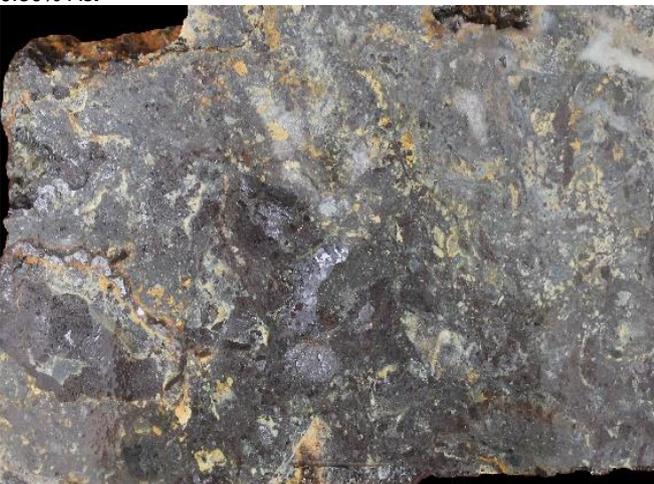
Epithermal Breccia Textures



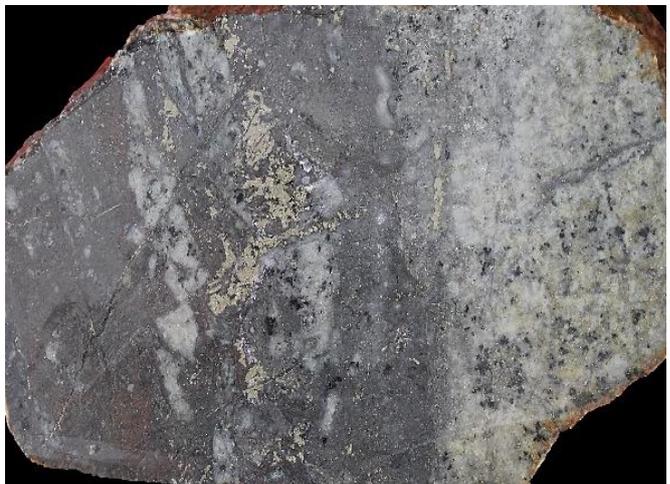
Multi-phase hydrothermal quartz vein breccia, KeumdongChilbo No 1 dump. Early low-temperature, banded dark grey sulphidic chalcedony veining has been brecciated with late-stage higher temperature comb quartz infill. Sample No 242727; 0.12g/t Au, 16g/t Ag, 648ppm Cu, 0.66% Pb, 0.14% Zn, 201ppm Sb, 131ppm Mo, & 0.30% As.



Hydrothermal breccia overprinted by jigsaw quartz-adularia vein-vugh infill, Keumdongchilbo. Sample 242728: 0.78g/t Au, 201g/t Ag, 0.14% Cu, 4.32% Pb, 5.61% Zn, 782ppm Sb, 45ppm Mo, 534ppm Cd, 1.14% As.



Hydrothermal massive sulphide breccia with black Fe-rich sphalerite (marmatite?) and galena in epithermal quartz and adularia, Goroseoksan. Sample 155508: 0.29g/t Au, 117g/t Ag, 3.87% Pb, 23.00% Zn, 0.40% Sb, 798ppm Cu, 0.40% As, >0.10% Cd



Siliceous sulphide breccia contact with monzonite, Goroseoksan. Sample 155507: 2.93g/t Au, 159g/t Ag, 0.32% Cu, 1.43% Pb, 3.06% Zn, 0.22% Sb, >1.00% As, 368ppm Cd, 43ppm Mo, 31ppm In.

Conceptual Model of Transitional Intermediate-Sulphidation Epithermal & Alkalic Porphyry Mineralization

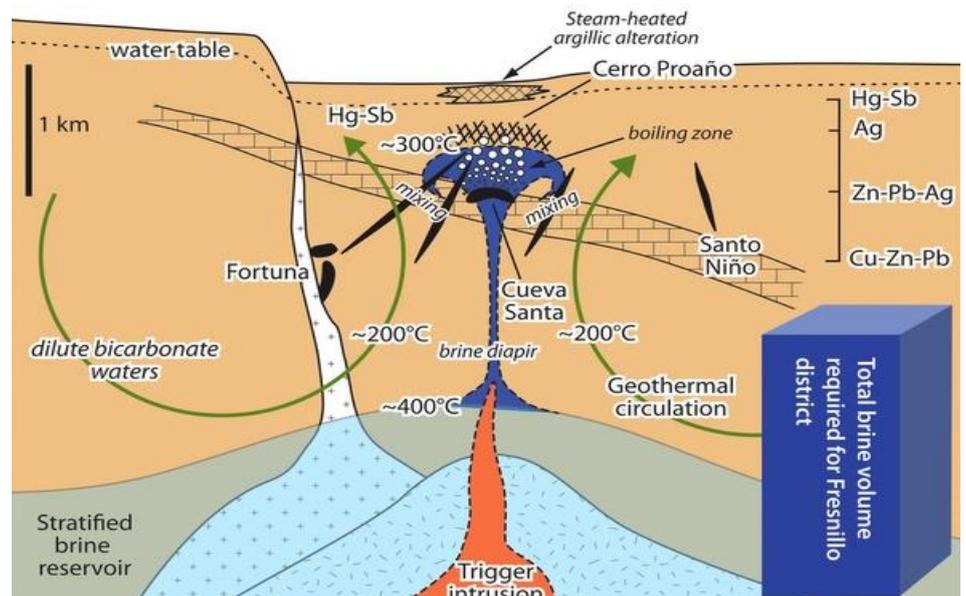
Intermediate-sulphidation (“IS”) epithermal style polymetallic Ag-Au deposits in Mexico occur as fissure vein-Ag-rich deposits in the Fresnillo, Zacatecas, Guanajuato and Palmarejo mining districts. Although more than 48,000 tonnes of silver have been mined since 1553, resources have increased substantially since 1985 as modern epithermal exploration has led to the discovery of ‘blind’ deposits at depth.

Mineralization consists of silver sulphides and sulphosalts, gold as electrum and Cu-Pb-Zn accompanied by As, Sb and Hg. A vertical geochemical zonation pattern is recognized. Ag occurs at shallow levels grading downwards to Zn-Pb-Ag, then Cu with Zn-Pb at depth. Au, Ag and Ag-Bi sulphosalts are typically associated with the “boiling zone”. Ba, As, Sb, Hg occur above this boiling zone at shallower levels closer to the palaeo-surface.

Alteration consists of argillic assemblages in the shallow, upper parts of the system, above the “boiling” ore zone, characterized by low-temperature silica phases, including cristobalite, opaline amorphous silica, fine silica-sulphide “silica gris”, chalcedony and Hg-Se-S-Cl complexes. A sub-horizontal zone of hypogene hematite occurs above and extends down into the “boiling” zone and is indicative of the fluid mixing zone with oxygenated meteoric waters. Deeper in the system, vein quartz contains chlorite, calcite, rhodonite and adularia, surrounded by sericite (phyllitic) and chlorite (propylitic) alteration assemblages. High-temperature zones may be indicated by skarn-type minerals (prograde silicates diopside, hedenbergite & garnet) and retrograde silicates (epidote, clinocllore).

Mineralization and alteration are consistent with magmatic-derived, chlorine fluids that injected into a circulating meteoric water geothermal system. Fluid flow is horizontal (Clarke & Titley, 1988) and boiling off of dissolved gases (mainly CO₂) increases the Ag/Au ratio. Higher grades of Ag are typically associated with higher salinities, suggesting proximity to the intrusive source may play an important role. The polymetallic Ag-Au mineralization of Mexico is regarded as equivalent to the carbonate-base metal Au deposits of the Southwest Pacific (Corbett, 2010). The characteristic features of low-temperature, intermediate-sulphidation epithermal deposits include:

- ❖ Surface expression is a subtle barren argillic cap that sits above ‘blind’ mineralization.
- ❖ The veins barely reach the surface, forming a wispy seditious zone below the barren cap.
- ❖ Mineralization is hosted in veins, stockworks and breccias. The veins can balloon out in size up to 10m in width.
- ❖ Mineralization displays coarse mineral banding, contrasting with the rhythmic fine banding of low-sulphidation veins.
- ❖ Dark brown Fe-rich sphalerite occurs in the early base metals stage and is indicative of high-temperature and salinity.
- ❖ Significant Cu-Pb-Zn occurs at depth from distal magmatically-derived fluids.
- ❖ Deposition is controlled by fluid mixing (Leach & Corbett, 2008), dilution and rapid cooling with oxidized meteoric waters, as the base metals are transported as chloride complexes.
- ❖ Gold and silver deposition is controlled by rapid cooling (Leach & Corbett, 2008) of a shallow “boiling” zone, typically located about 400m below the palaeo surface.
- ❖ Honey-yellow Fe-poor sphalerite is deposited late stage and is an indicator of lower temperatures, commonly associated with Ag-bearing sulphosalts, freibergite and electrum.
- ❖ The vertical extent of mineralization can be over 450m.
- ❖ Alunite-like high-sulphidation minerals may occasionally be present. Exploration focus directed to locating acid-sulphate caps (evidenced by kaolinite-alunite alteration), as high-grade Au-Ag can deposit at depth.



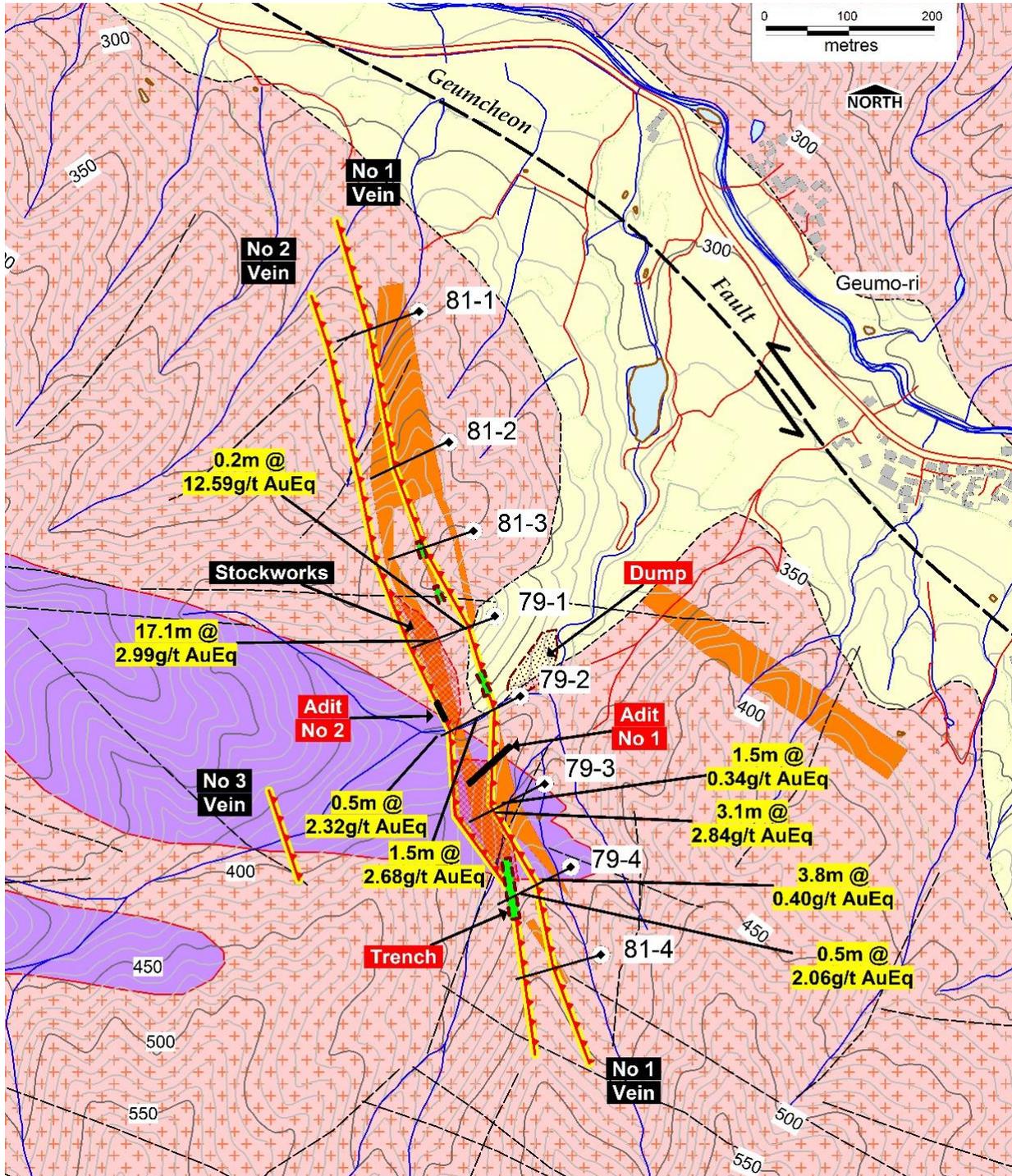
Mexican Style Au-Ag-Cu-Pb-Zn Epithermal Mineralization Model (after Williams et al, 2013).

Developing Polymetallic Mines on the Korean peninsula

Drilling (Historical)

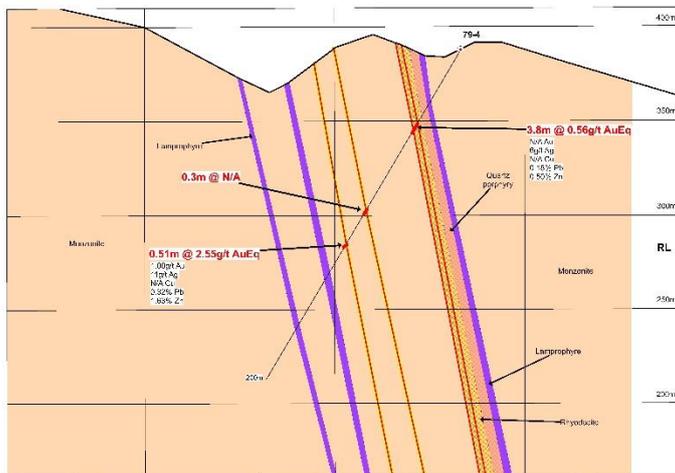
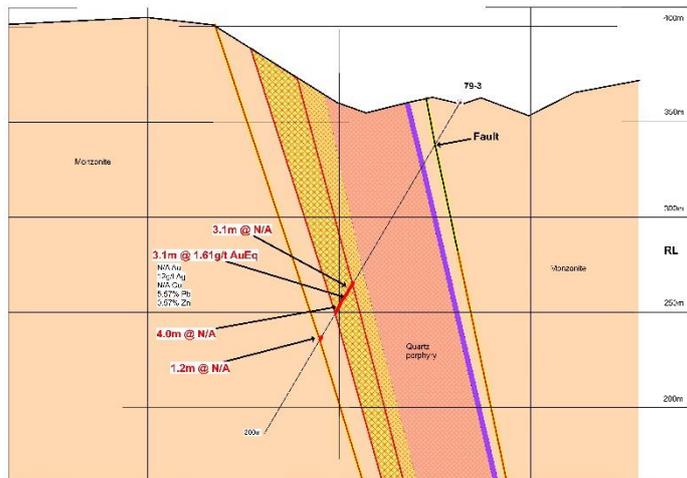
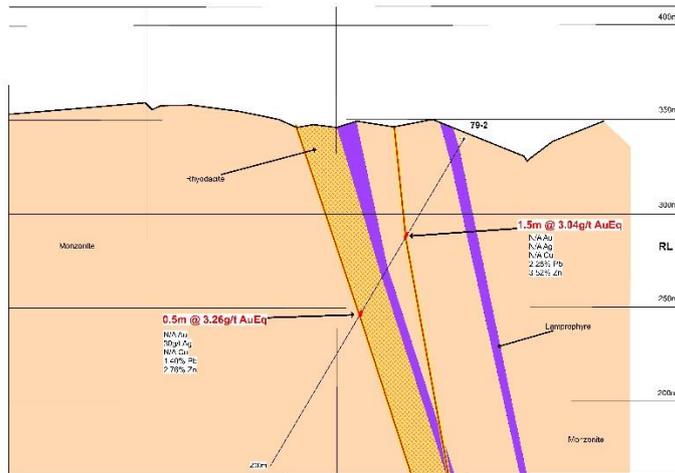
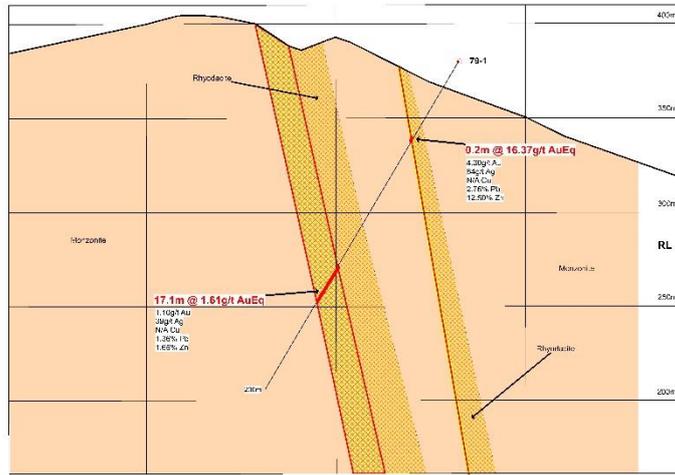
The KMPC drilled 4 diamond drill holes (4 x 200m) at KeumdongChilbo in 1979, followed by another 4 holes (4 x 200m) in 1981. Drillhole spacing was approximately 100m. Each hole was drilled at an angle of 60° on an azimuth of 245-250°, roughly perpendicular to the strike of the main vein-breccia structure.

The drilling intersected some wide zones of brecciated, sericite alteration, accompanied by narrow, 20-50cm thick sulphide veins and mineralized veinlets forming a stockwork zone up to 20m in width. Significant mineralized drill intersections were recorded from 4 adjacent holes over a strike length of 500m (Se Woo, 2008). However, it is worth noting that several sulphide veins and quartz veins, recorded in the drill logs, were not sampled/assayed. In addition, Cu was not assayed, although rock chip sampling by KME indicates it is present.



Geological Map of KeumdongChilbo Mine, with significant mineralized intersections.

The location of the mapped No 1, No 2 and No 3 Vein Structures, the 2 Adits and 8 drillholes is shown. The small village of Geumo-ri is just to the northeast. Basalt/gabbro (blue) is mapped as intruding biotite granite, with a northwest striking rhyodacite dyke that parallels the NW striking Geumcheon Fault, a major extensional transfer fault structure displaying sinistral displacements.



Developing Polymetallic Mines on the Korean peninsula

Resource Estimates

Senlac Geological Services Pty Ltd (2017) compiled a drilling database from the historical drilling data, with significant drill intersections presented below and illustrated on the geological map. Using the historical KMPC drill results, Senlac Geological Services Pty Ltd prepared a preliminary resource estimate, using several assumptions, including:

- ❖ True vein width could not be estimated because of the absence of orientated core.
- ❖ Individual vein panels extend to the mid-point between drill holes, 100m along strike and 200m down-dip.
- ❖ No minimum widths, or mining parameters, or cutting of grades was applied.
- ❖ The Mineral Resource tonnages and grades were estimated on a dry in-situ basis. The estimate is undiluted, so appropriate dilution needs to be incorporated in any evaluation of the deposit.

Senlac Geological Services Pty Ltd (2017) estimated an Exploration Target for the Keumdongchilbo mine of **1,233,760 tonnes @ 0.94g/t Au, 35g/t Ag, 0.00% Cu, 2.19% Pb & 1.85% Zn** (as tabulated below).

Cautionary Statement: It should be noted this Exploration Target is based on wide-spaced historical drilling and does not comply with current NI43-101 or JORC 2012 requirements.

Significant Mineralized Drill Intersections & Resource Estimate, Keumdongchilbo Mine.

Hole ID	Width (m)	Grade AuEq (g/t)	Grade Au (g/t)	Grade Ag (g/t)	Grade Cu (%)	Grade Pb (%)	Grade Zn (%)	Length (m)	Depth (m)	Volume (m ³)	SG (g/cc)	Tonnes (t)
79-1	0.2	16.37	4.30	84		2.76	12.50	107	200	4,280	2.75	11,770
	17.1	1.61	1.10	39		1.36	1.65	107	200	365,940	2.75	1,006,335
79-2	1.5	3.04				2.28	3.52	100	200	30,000	2.75	82,500
	0.5	3.26				1.40	2.76	100	200	10,000	2.75	27,500
79-3	3.1	0.56		21		10.16	1.04	113	200	38,420	2.75	105,655
TOTALS		4.03	0.94	35		2.19	1.85		200	448,640	2.75	1,233,760

NOTES:

- ❖ AuEq was calculated using metal prices as at August 2017:
Au = US\$1284/oz, Ag = US\$16.94/oz, Cu = US\$2.93/lb, Pb = US1.06/lb & Zn = US\$1.41/lb.
- ❖ Intersections of >4.0m, >250,000 tonnes and a grade of >4g/t AuEq are highlighted in dark red font.
- ❖ Some intersections contain intervals which were not assayed. For the purposes of aggregation into composited intersections, these intervals have been assigned zero value, although it is likely they carry some low grades.
- ❖ Cu was not assayed.

This resource has contained metals of 37,202 ounces gold, 1,389,931 ounces of silver, 27,045 tonnes of lead and 22,842 tonnes of zinc. The contained metals have an insitu value of about US\$205,337,976 (approximately US\$166/t), using metal prices as of August 2017. The relative value distribution of the metals is 23.26% gold, 11.47% silver, 30.71% lead and 34.56% zinc. The contained metals are approximately “equivalent” to 159,921 contained ounces of gold, using August 2017 metal prices (notes).

Rehabilitation of Historical Workings

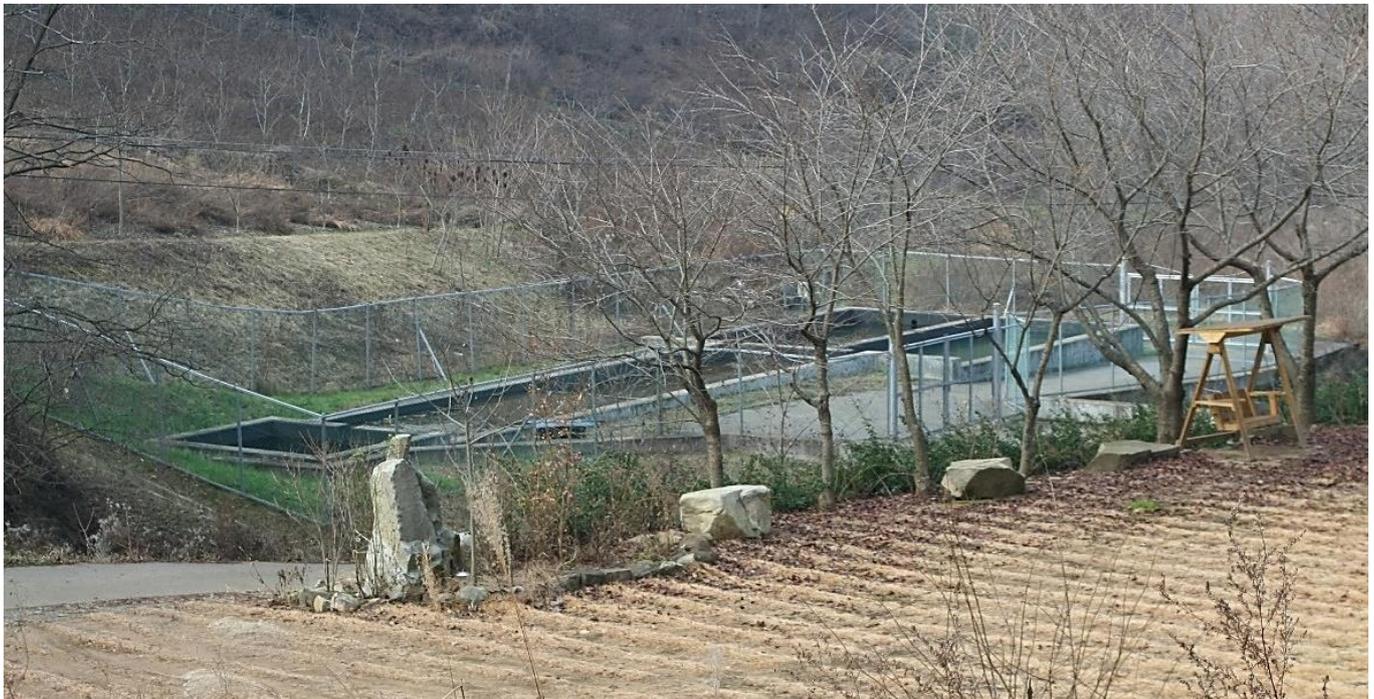
Following environmental investigation (Lee et al, 2003), the dumps and workings were rehabilitated by the *Korea Mine Reclamation Corporation* (“MIRECO”). Remedial work included replacement of topsoil and revegetation of the mine dumps and workings and rock retaining wall support installed on creek banks. A mine run-off water treatment facility was installed on the creek draining the Goroseoksan mine workings. The facility treats the mine run-off water, collecting base metals in a series of filtration ponds, the sediment is then dried and the “cake” transported to a base metal refinery for processing.



Revegetated mine workings at the Goroseoksan mine. A rockwall silt trap placed in the creek is evident in the foreground.



Rock retaining wall and silt trap placed in the creek draining the Goroseoksan mine workings.



The mine run-off water treatment facility operated by MIRECO, with some fenced off mine dumps visible at top left, located downstream from the Goroseoksan mine

Development Potential

The Keumdongchilbo-Goroseoksan vein-breccia structure has a strike length of 7,000m and warrants further exploration, including geological mapping, soil geochemical survey, geophysical survey and subsequent drill testing of anomalous targets.

The resource identified at Keumdongchilbo is potentially exploitable as a satellite mine, trucking “flash flotation” concentrates to a central mill facility for sequential flotation processing. The steeply-dipping vein mineralization is amenable to mining using the *Sustainable Mining by Drilling* method using Pile Top Reverse Circulation Drills.

Critical metals are associated with the Au-Ag-Pb-Zn mineralization and include Sb, In, Bi and Mo. Along with Cu, these elements were not assayed in the historical exploration programs. These metals have significant potential as valuable by-products recovered during sequential flotation production of Pb and Zn concentrates.

References

- Chi, S.J., Doh, S.J., Choi, S.G., & Lee, J.H., 1989. Geochemistry of Cu-Pb-Zn-Ag deposits from the Euseong mineralized area, *Journal of Korean Institute of Mining Geology*, 22, 253-266.
- _____, & Koh, Y.K., 1991. Gold-silver mineralization of the Euseong area, *Journal of Korean Institute of Mining Geology*, 24, 2,151-165.
- Choi, P.Y., Lee, S.R., Ko, I.S., & An, G.O., 2004. Movement History of the Gaeum Fault System, *Geology of Korea, Special Publication 2*, 211-228.
- Hwang, S.K. & Yang, J.I., 1977. Feasibility study of oxidized lead-zinc-copper ore by heating flotation from Jun Hung mine, in Report on Geoscience and Resources, Volume 2, *Korean Mining Promotion Corporation*, 275-282.
- KIGAM, 2001. Geochemical Atlas of Korea (1:700,000), Series 1-7, *Korea Institute of Geoscience and Mineral Resources*.
- KIGAM, 2009. Magnetic Anomaly Maps of Korea, 1:100,000 scale, *Korea Institute of Geoscience and Mineral Resources*.
- Kim, J.B., 1964. Summarized Report on Beneficiation Studies of Lead-Zinc ore from Taedonga mine, *Geol. Soc. Korea Technical Paper No 4*, 149-151.
- Lee, M.H., Choi, J.C., & Kim, J.W., 2003. Distribution and remediation design of heavy metal contamination in farm-land soils and river deposits in the vicinity of the Goro abandoned mine, *Econ. Environ. Geol.*, 36, 2, 89-101.
- Lee, S.Y., Choi, S.G., So, C.S., Ryu, I.C., Wee, S.M., & Heo, C.H., 2003. Base-metal mineralization in the Cretaceous Gyeongsang Basin and its Genetic Implications, Korea: the Haman-Gunbug-Goseong (Changwon) and the Euseong Metallogenic Provinces, *Econ. Environmental Geology*, 36, 4, 257-268.
- Sennitt, C.M., 2017. Uiseong Au-Ag-Cu-Pb-Zn Project, South Korea, *Unpubl. Co. Rept., Senlac Geological Services Pty Ltd*.
- Se-Woo Mining, 2008. KeumdongChilbo Pb-Zn Mine, *Unpubl. Co. Rept., Se-Woo Mining Co Ltd*.